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WATER-SUPPLY PAPER 279

WATER RESOURCES

OF THE

PENOBSCOT RIVER BASIN
MAINE

BY

H. K. BARROWS AND C. C. BABB

PREPARED IN COOPERATION WITH THE
MAINE STATE SURVEY COMMISSION

WASHINGTON
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WATER RESOURCES OF PENOBSCOT RIVER BASIN, MAINE.

By H. K. Barrows and C. C. Babb.

INTRODUCTION.

This report on the Penobscot River drainage system, the largest and one of the most important in Maine, has been compiled chiefly from the records, reports, and maps of the United States Geological Survey and from the results of surveys made in cooperation with the Maine State Survey Commission. The report includes all data on precipitation, stream flow, water storage, and water power that were available at the end of the calendar year 1909 and is accompanied by plans and profiles of the principal rivers, lakes, and ponds in the basin (Pls. XIII–XIX, at end of volume). Stream-flow data for 1910 and 1911 will be published in Water-Supply Papers 281 and 301, respectively. The surveys for these plans and profiles were made in the years indicated below:

Penobscot River: Bangor to North Twin Lake, 1904.
Penobscot River, West Branch: Chesuncook Lake to Seeboomook, 1905; Chesuncook Lake to Ambejejus Lake, 1906.
Mattawamkeag River: Mouth to North Bancroft, 1907.
Various lakes and ponds in the East Branch, Mattawamkeag and Piscataquis basins, 1907.
East Branch Penobscot: Grand Lake to Medway, 1908.

Topographic maps and geologic folios[1] of a portion of the Penobscot basin have been published by the United States Geological Survey. The unit of survey adopted is a rectangular area bounded by meridians and parallels and known as a quadrangle, and in Maine is 15 minutes in extent each way and one-sixteenth of a square degree in area. The quadrangles have no relation to political boundaries, such as those of States, counties, and townships. Each quadrangle is designated by the name of some well-known place or feature within its limits. The quadrangles surveyed in the vicinity of Penobscot River are listed below.

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[1] These topographic maps may be obtained for 5 cents each by addressing the Director, United States Geological Survey, Washington, D. C. The geologic folios cost 25 cents each. An index map showing areas in Maine covered by maps and folios will be sent on application.

Bangor.
Orono.
Bucksport.
Orland.
Castine.
Bluehill.
Vinalhaven.
Deer Isle.
} Published also in one sheet called Penobscot Bay.
Rockland.
Tenants Harbor.
Matinicus.
Swan Island.
Mount Desert.

Geologic folios have also been published for Rockland and for Penobscot Bay (Bluehill, Castine, Vinalhaven, Deer Isle).

Special acknowledgment is due H. S. Ferguson, engineer of the Great Northern Paper Co., for much valuable information regarding the West Branch of the Penobscot; also to the West Branch Driving & Reservoir Dam Co. and the East Branch Driving Co.

GENERAL FEATURES OF THE BASIN.

TOPOGRAPHY AND DRAINAGE.

The Penobscot River basin lies wholly in Maine and comprises about 8,500 square miles, or more than 25 per cent of the area of the State. It extends from the basin of the St. John on the north to the Atlantic Ocean on the south, and from the Kennebec basin on the west to the St. Croix, Machias, and Union River basins on the east. It is about 160 miles long and its extreme width is about 115 miles. (See Pl. I.)

The Penobscot is formed by two principal branches, the West Branch and the East Branch. The West Branch, here considered the main stream, rises in the mountainous region near the Canadian boundary and flows in a general southeasterly direction for more than 100 miles to its junction with the East Branch at Medway. The East Branch formerly rose in small lakes and ponds lying about midway between the western and eastern boundaries of the State, but about 1840 the drainage area tributary to Chamberlain and Telos lakes, whose natural flow is into the St. John basin, was added to that of the East Branch. (See p. 172.) The headwaters of the East Branch flow eastward until they reach Grand Lakes, where the stream turns and flows southward to its junction with the West Branch. From the mouth of the East Branch to tidewater at Bangor is about 75 miles; from Bangor to the mouth of the river the distance is 27 miles. The river is therefore about 200 miles long.

Two other important branches of the Penobscot are Mattawamkeag and Piscataquis rivers. The Mattawamkeag drains an area of 1,500

square miles in the extreme eastern portion of the basin, including many swamps and much low land, and joins the main river from the east about 12 miles below Medway. Piscataquis River, whose headwaters adjoin those of the Kennebec, also drains an area of 1,500 square miles, lying to the southeast of Moosehead Lake, which is in general much higher than that of the Mattawamkeag basin. The Piscataquis joins the Penobscot just above West Enfield.

The general elevation of the area drained by the Penobscot is somewhat less than that of the Kennebec basin, for the latter is nearer the summit mountain range which forms the western boundary of the State. As a whole its topography is rather uniform. Hills and low mountains extend backward from the coast and north of Bangor merge into an undulating plain, which to the west is more broken and diversified by hills, detached peaks, lakes, ponds, and swamps. At the south and west it merges into the Kennebec basin and at the north into that of the Allagash; on the northwest it terminates in a highland region interspersed with swamps and lagoons, which furnish water to both the Penobscot and the St. John. A large part of the basin is what is known as "wild land," heavily timbered and known only to lumbermen and sportsmen.

Mount Katahdin, the highest mountain in the State, lies in a detached range between the West and East branches. The highest of its three peaks is 5,273 feet above sea level. From its top may be seen the waters of both branches of the river, including many lakes and ponds, and toward the west Moosehead Lake at the head of the Kennebec.

The Penobscot drainage system is remarkable for its large number of lakes and ponds, which assist markedly in equalizing the flow of the river, though no single lake or series of lakes in the system can compare with the Umbagog-Rangeley lakes of the Androscoggin basin or with Moosehead Lake in the Kennebec basin as a reservoir to tide over dry-weather flow, for the lakes and ponds tributary to the Penobscot are so widely scattered that they can not be commanded by a few artificial structures. There are, however, so many opportunities for economical storage in this basin as a whole that it is destined, with proper development, to afford some of the best water power in the State.

The table following, compiled from publications of the United States Geological Survey and from the best maps obtainable, shows the drainage area at different points on the Penobscot River and its tributaries.

Drainage areas of Penobscot River and principal tributaries.

Stream.	Point of measurement.	Drainage area (square miles).
Penobscot, South Branch	Above mouth of North Branch	186
Penobscot, North Branch	Above mouth South Branch	272
Penobscot, West Branch	Seeboomook dam, just below Nulhedus Stream	530
Do	Entrance into Chesuncook Lake	825
Do	Outlet of Chesuncook Lake	1,330
Do	Outlet of Ripogenus Lake	1,410
Do	Abol Falls	1,550
Do	Head of Ambejejus Lake	1,600
Do	Millinocket, dam at foot of Quakish Lake	1,880
Do	Above junction with East Branch	2,100
Penobscot	Below and including East Branch	[a] 3,230
Do	Above mouth of Mattawamkeag River	[a] 3,360
Do	Below and including Mattawamkeag River	[a] 4,860
Do	Above mouth of Piscataquis River	[a] 5,100
Do	Below and including Piscataquis River at West Enfield gaging station	[a] 6,600
Do	Below and including Sunkhaze Stream	[a] 7,210
Do	Above mouth of Pushaw Stream, Old Town	[a] 7,270
Do	Below and including Pushaw Stream	[a] 7,400
Do	Bangor Water Works dam	[a] 7,720
Do	Mouth, at head of Penobscot Bay, opposite Sandy Point	[a] 8,570
Caucomgomuc Stream	Outlet of Caucomgomuc Lake	174
Do	Entrance into Chesuncook Lake	230
Umbazooksus Stream	do	50
Chesuncook Lake	Exclusive of previous two rivers	225
Allagash Stream	Outlet Allagash Lake	102
Do	Entrance into Chamberlain Lake	124
Chamberlain Lake	Telos dam	270
Penobscot, East Branch	Webster Lake Outlet	[a] 288
Do	Grand Lake dam	[a] 496
Do	Grindstone gaging station	[a] 1,100
Do	Mouth	[a] 1,130
Mattawamkeag, West Branch	Outlet Mattawamkeag Lake	305
Do	Above junction with East Branch of Mattawamkeag River	352
Mattawamkeag, East Branch	Just below outlet from Pleasant Pond	79
Do	Above junction with West Branch of Mattawamkeag River	158
Mattawamkeag	Above mouth Baskahegan Stream	610
Do	Below and including Baskahegan Stream	874
Do	Below and including Molunkus Stream	1,370
Do	Gaging station, practically at mouth	1,500
Baskahegan Stream	Outlet of Baskahegan Lake	151
Do	Mouth	264
Molunkus Stream	do	195
Piscataquis	Lows Bridge, gaging station	286
Do	Dover	369
Do	Above mouth of Sebec River	463
Do	Below and including Sebec River	856
Do	Below and including Pleasant River	1,200
Do	Above mouth of Schoodic Stream	1,240
Do	Below and including Schoodic Stream	1,300
Do	Above mouth of Seboeis Stream	1,350
Do	Mouth	1,500
Sebec	Outlet Sebec Lake	367
Do	Mouth	393
Lower Ebeemee Lake	Outlet	87
Pleasant	Outlet Silver Lake	104
Do	Mouth	334
Houston Pond	Outlet	21
Schoodic Lake	do	32
Schoodic Stream	Mouth	58
Seboeis Lake	Outlet	49
Endless Lake	do	66
Seboeis Stream	Mouth	150
Passadumkeag Stream	Above mouth of Nicatous Stream	171
Do	Mouth	383
Pushaw Stream	Outlet Pushaw Lake	125
Do	Mouth	263
Kenduskeag Stream	Above mouth of Black Stream	136
Do	Near Bangor at gaging station	[b] 191
Do	Mouth	[b] 214
Souadabscook Stream	Above mouth of Black Stream	100
Do	Mouth	[c] 203
Black Stream	Total drainage	35

[a] Includes Chamberlain Lake drainage, 270 sq.
[b] Includes all drainage area of Black Stream.
[c] Not including any drainage area of Black Stream.

According to Wells[1] there are 1,604 streams in the Penobscot basin. The most important of these streams and ponds are listed in the following table and are described in the gazetteer, pages 221–279.

GEOLOGY.

By Edson S. Bastin.

The rocks and soils of the Penobscot basin have an important influence on the course and fall of the river and its tributaries and on the composition of the waters; and certain events in the geologic history of the basin have determined the present positions of the streams and their associated lakes and swamps.

By far the larger part of the rocks are shales, slates, and schists. Granite is found in the Mount Katahdin region and near the mouth of the river in the vicinity of Mount Waldo. Limestones, sandstones, and volcanic rocks are also present, but are comparatively of little importance.

Where the rocks are relatively soft shales, slates, and schists, as in the stretch for many miles above Bangor, the valley is broad; where the stream traverses an area of granite and of schists intruded by granite, as between Hampden and Bucksport, it flows in a deep valley with steep walls. The prevalence of rocks of the clayey type and the scarcity of limestone undoubtedly have an important influence on the composition of the river water.

In all humid climates the streams are the principal agents in shaping the land surface, gradually washing away the soil and carrying it to the sea. By this process the land may be finally reduced to a plain surface sloping gently toward the sea, but upward movements of the earth's crust may interrupt or disturb the process and stimulate the streams to renewed activity. A stream once well established tends to maintain its original position, and some portions of its course may be of great antiquity. Parts of the channel of the Penobscot are doubtless very old. It is certain that at a time immediately preceding the glacial period the river was well established; that in parts of its course, particularly those in soft rocks, it had excavated a broad valley through which it meandered, and that in other parts, where the rocks were harder, its valley was gorgelike. Its drainage basin at this period was undoubtedly smaller than at present, streams that are now its tributaries then flowing into neighboring drainage basins. Among these streams were probably the West Branch of the Penobscot, west of Chesuncook Lake, which before the glacial period presumably drained either northeastward to the St. John or southward to the Kennebec. The submerged portion of the river valley below Bangor and the deep submarine channels that extend for some distance seaward in prolongation of the river valley proper must have been formed mainly when the land stood higher than now, for the gentle current in this portion of the river and the scouring effect of the tide are entirely inadequate to produce the conditions observed.

---

[1] Wells, Walter, Water powers of Maine.

A second epoch in the history of the river basin was begun by the great continental glaciers which moved southward from the highlands of Labrador, covering the whole region with a thick mantle of ice to a line far beyond the present coast. This mass of ice carried below and within it great quantities of rock and soil, which it deposited chiefly on the lowlands. The ice mass also in many places lowered and reshaped the land surfaces, particularly the hills. At the same time, perhaps because of the weight of the ice, the land sank several hundred feet below its present level. As the ice melted the muddy waters flowing from it laid down deposits of coarse gravel in the depressions of the land surface and carried fine sand and clay into the great arms of the sea which indented the land. The results of these changes in the drainage basin are plainly apparent in its present surface features. The lakes and swamps so abundant throughout Maine are the result of the obstruction of stream valleys by the deposits laid down at this time.

The glacial deposits also changed the courses of the river and its tributaries, diverting water from other river basins to that of the Penobscot and shifting the course of the stream. Many of these changes can still be traced. For example, what appears to be an old channel of Penobscot River is now occupied by one of its small tributaries, Sunkhaze Stream, which enters the main river a short distance north of Oldtown. The valley extending from North Bangor to Hammond Pond, now occupied by a chain of swamps and lakes, also represents probably the old valley of the Penobscot or of one of its important tributaries, as does also the depression occupied by Pushaw Lake and its neighboring swamps. The shifting of the streams from the old to the new courses has an important economic interest, for in excavating their new courses the streams in many places encountered ledges and ridges of rock and developed falls and rapids which now afford great water powers.

The development of the river is still in progress. Every day it is transporting material from land to sea and making changes in its course which, if long continued, must produce results as great as those heretofore recorded.

FORESTS.[1]

The area of the State of Maine is 29,895 square miles. Of this area 21,000 square miles, or 13,440,000 acres, is forest land. Of this timber land more than 2,500,000 acres (about 3,900 square miles) lies in the Penobscot River basin.

The timber now standing in this section consists mainly of spruce, although it includes also much cedar. In the Piscataquis Valley and in the lower West Branch region white birch is common. It is estimated that the so-called soft woods now standing in the whole Penobscot drainage basin include 5,166,000,000 feet of spruce, 438,000,000 feet of cedar, and 153,000,000 feet of pine. The use of hardwoods is increasing in the many novelty mills throughout the State, but the hardwood most used is white birch.

Forest growth in this basin is rapid, and if economically cut and properly guarded from forest fires the supply of available timber should last many years.

POPULATION.

The following table, based on the census of 1910, gives the population of the principal cities and towns in the Penobscot basin:

Population of principal cities and towns in Penobscot basin.

Bangor	24,803	Hermon	1,210
Bradford	930	Island Falls	1,686
Brewer	5,667	Kingman	741
Brownville	1,808	Lincoln	1,167
Bucksport	2,216	Millinocket	3,368
Carmel	1,050	Milo	2,556
Corinth	1,034	Monroe	872
Danforth	1,295	Monson	1,243
Dover	2,091	Oldtown	6,317
East Millinocket	923	Orland	1,224
Enfield	970	Orono	3,555
Foxcroft	1,867	Orrington	1,219
Frankfort	1,157	Patten	1,406
Greenville	1,474	Sangerville	1,319
Guilford	1,680	Sherman	1,053
Hampden	2,380	Winterport	1,582

INDUSTRIES.

The great forests of the basin and the water power afforded by the river and its tributaries have an important influence on the industries of the region. Long and short lumber, including shingles, boards, laths, etc., and pulp, paper, and woolen goods are extensively manufactured.

---

[1] Fourth Report Forest Commissioner of Maine, 1902.

Bangor, Brewer, Dover, Foxcroft, Guilford, Orono, Oldtown, Millinocket, East Millinocket, and Lincoln are the most important manufacturing centers.

The manufacture of pulp and paper has during the last 10 years come to be one of the leading industries of the area. Conditions are ideal for this industry, which has probably not yet reached its maximum development. The mills have a daily capacity of over 800 tons of pulp and about 550 tons of paper. The daily capacity of the plants of the Great Northern Paper Co. at Millinocket and East Millinocket is 480 tons of pulp and 430 tons of paper. (See Pls. II, III, and V.)

Of the 725 million feet of logs cut in Maine during the winter of 1907–8 about 230 million feet were cut in the Penobscot basin. How much of this was for the use of pulp and paper mills is not definitely known, but it must have been a considerable part of the total. Of 115 million feet cut in the basin of the West Branch of the Penobscot, about 90 million feet were used by the Great Northern Paper Co., which used also 10 million feet more obtained by rail.

The greater part of the territory north of Piscataquis and Mattawamkeag rivers consists of wild lands, mostly covered with forests. A number of towns on the border of these wild lands having rail connections carry on a thriving business as depots of supply for the lumbering interests. Many of the small towns and settlements scattered through the area support some local industry, but more are populated chiefly by those who raise crops in the summer and who work in the woods cutting and hauling logs in the winter.

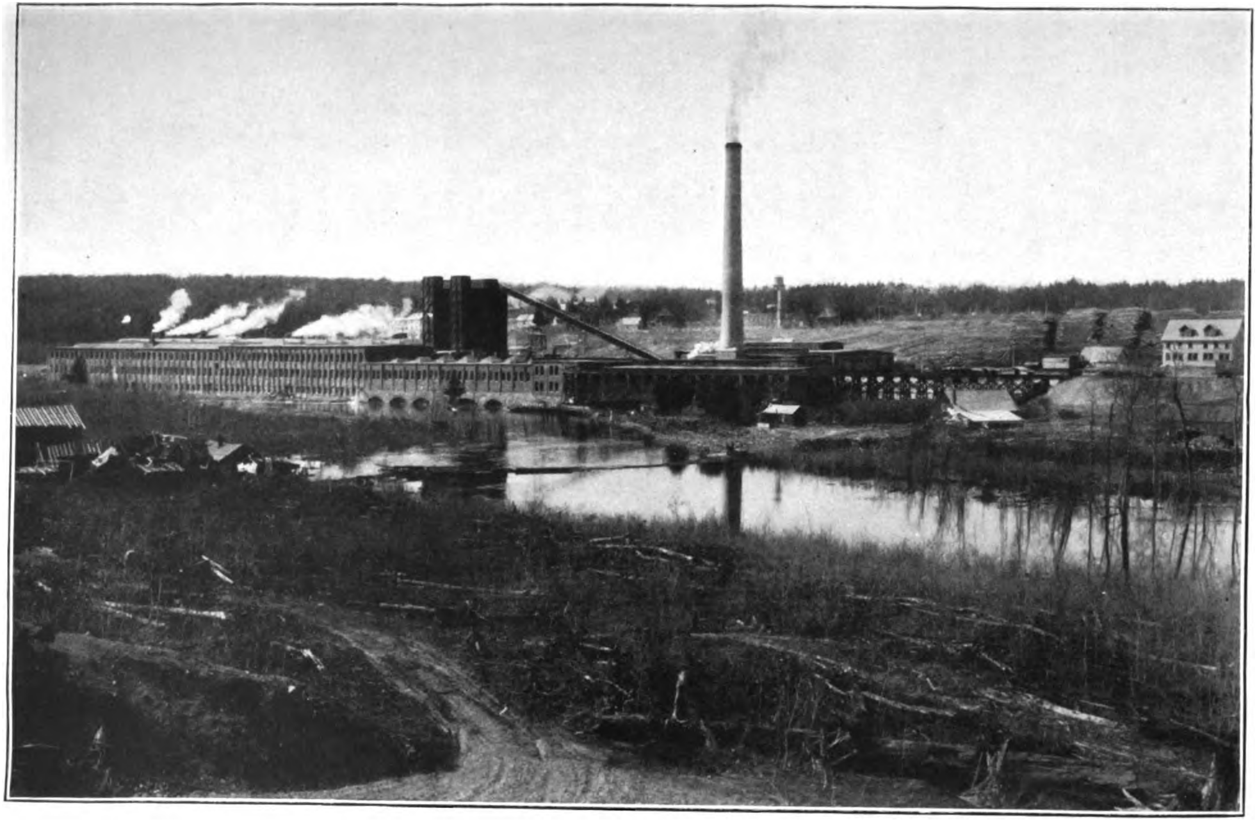
The northeastern section lies in the potato belt of Aroostook County, which has become famous over all the country for the quality and amount of its products. In some parts of the valley there are excellent farms, which raise profitable crops and excellent stock. Sweet corn is grown for canneries; poultry, eggs, butter, and milk are provided for the market; and sheep are raised for wool.

Ice cutting is also among the important industries.

TRANSPORTATION LINES.

Bangor, the principal city of the Penobscot basin, is located 40 miles from the coast, on tidewater, at the head of navigation. The port is open to navigation from about April 1 to December 15.

The Maine Central Railroad, the direct route to Boston via the Boston & Maine Railroad, passes through Bangor and continues along Penobscot River as far as Mattawamkeag, then along the Mattawamkeag as far as Bancroft, where it leaves the Penobscot basin, continuing to Vanceboro. A branch of this road continues down the river from Bangor for 20 miles to Bucksport, on Penobscot Bay.



MILL OF GREAT NORTHERN PAPER CO. AT MILLINOCKET.

Another branch from Bangor passes into the Union River drainage basin to Ellsworth and Bar Harbor. Dover and Foxcroft, on the Piscataquis branch, are reached by a branch of the Maine Central starting from Newport Junction, a town about 25 miles west of Bangor.

The Bangor & Aroostook Railroad connects with the Maine Central at Bangor, Oldtown, and Foxcroft, and extends from Searsport to Fort Kent and Van Buren, two towns in the St. John drainage basin, in the extreme northern part of the State. The line running to Van Buren parallels that connecting with Fort Kent at a distance of 15 to 25 miles farther east and extends very close to the eastern boundary of the State for the most of the distance north from Grand Lake on St. Croix River. This line is practically all outside the Penobscot basin.

Another branch of the Bangor & Aroostook Railroad extends from Milo Junction, on Piscataquis River, about 18 miles above its confluence with the Penobscot at Howland, and along the Piscataquis to Greenville Junction on Moosehead Lake. Still another branch of this railroad has been partly surveyed from one of the southerly points on the main line along West Branch of Penobscot waters to the foot of Chesuncook Lake, and thence to Chamberlain Lake, on the East Branch, and along Allagash River to St. John River. If built this line will open up a large territory, rich in timber and water power, heretofore inaccessible except by team or waterways.

The main line of the Canadian Pacific Railway from the west crosses the Penobscot basin in an easterly direction from Greenville to Mattawamkeag and Vanceboro, connecting with the Bangor & Aroostook Railroad at Greenville, Brownville Junction, and Lake View, and with the Maine Central Railroad at Mattawamkeag.

The basin as a whole is fairly well equipped with facilities for transportation by rail, and this, with its two ports, Bangor and Searsport, should attract further industries to this part of the State. The northwestern part of the basin will, however, remain practically inaccessible until some of the projected railroad lines are built.

PRECIPITATION.

[Contributed by the U. S. Weather Bureau.]

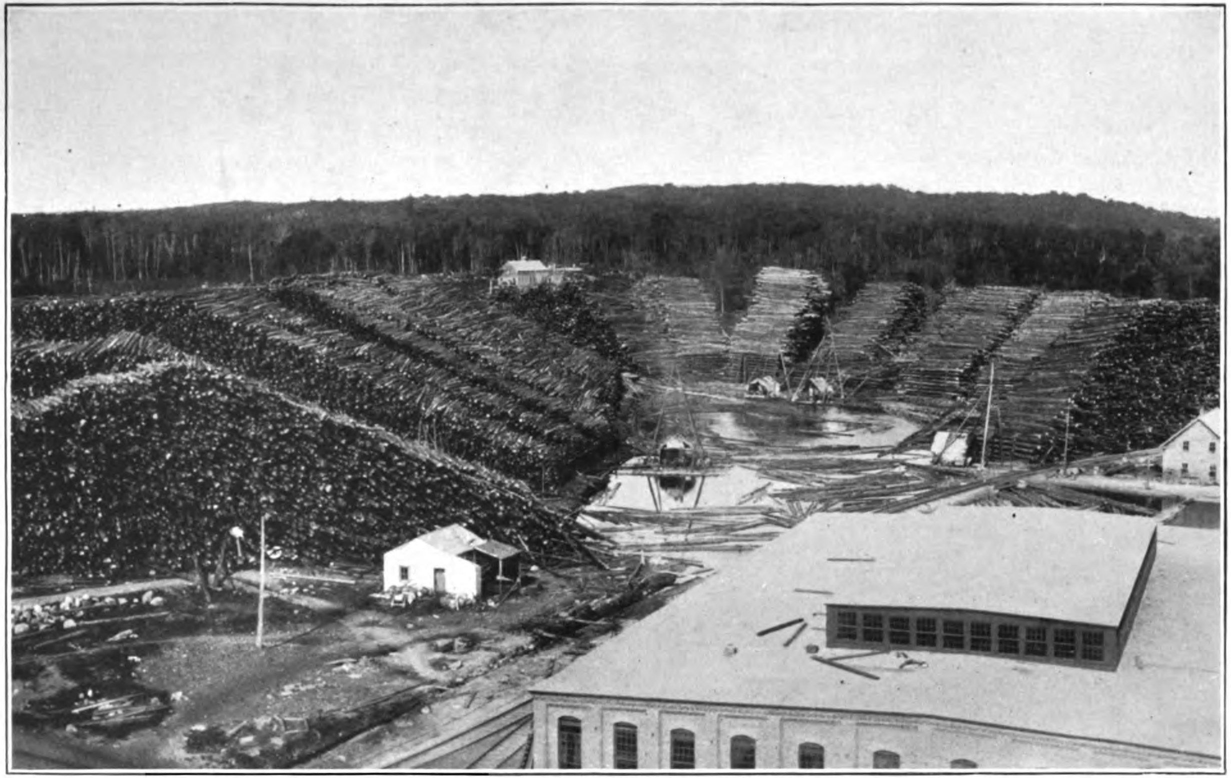
Precipitation stations have been maintained by the United States Weather Bureau at the following places in the Penobscot River drainage basin and its immediate vicinity:

Weather Bureau stations in Penobscot River basin.

Station.	County.	Approximate elevation above sea level, in feet.	Period.
Bar Harbor	Hancock	50	1885-1910
Belfast	Waldo	165	1891-1904
Carmel	Penobscot	175	1900-1902
Chesuncook Dam	Piscataquis	930	1905-1909
Chesuncook (post office)	do	950	1904-1906
Danforth	Washington	386	1902-1910
Debsconeag	Piscataquis	675	1905-1909
Fairfield	Somerset	90	1886-1908
Greenville	Piscataquis	1,000	1904-1910
Houlton	Aroostook	362	1892-1896 1902-1910
Kineo	Piscataquis	1,100	1895-1903
Mayfield	Somerset	1,000	1885-1907
Millinocket	Penobscot	386	1899-1910
Orono	do	129	1869-1910
Patten	Aroostook	550	1902-1910
South Lagrange	Penobscot	181	1903-1905
The Forks	Somerset	590	1901-1910

The earlier measurements of precipitation in the upper portion of the Penobscot basin are fragmentary, and few reliable data are available for determining the average fall in that part of the area. Over the central and southern parts of the basin, however, fairly continuous records have been maintained long enough to determine averages that may be considered sufficiently accurate for all practical purposes.

The amount of precipitation at any given point varies greatly from year to year, and the records for even considerable periods may show marked variations from those for other periods, so that records for short periods can not without proper corrections be safely accepted as indicating even approximately the average which would be determined from observations covering a long period. But however much the precipitation in a district may vary during certain periods from the average of a long period, there is a more or less constant ratio between the fall at different points in the region, some places receiving on the average more or less than other places, owing to the influence of local topography, the exposure of the gage, and other conditions. If this fact is borne in mind it is possible so to correct short-period records of stations that they will approximate what they would have shown had observations been made continuously throughout the entire period of observations in the district.



TWENTY-ONE MILLION FEET OF LOGS AT THE MILLINOCKET MILL OF THE GREAT NORTHERN PAPER CO.

This method of correction, known as the "Fournie method," is used for reducing meteorological observations to what is generally called the fundamental period. The fundamental period covered in this discussion is the 42-year period 1869 to 1910, inclusive, during which nearly continuous records of precipitation have been kept at the State college at Orono, and an effort has been made to reduce all the short-record observations to what they would have shown had observations been continuous at each station throughout the entire period.

The record at each station in the tables following was therefore compared with the record for the same months and years at the Orono station, and such corrections applied as the ratio between the rainfall at the two stations indicated as necessary.

In order, however, that investigators of the quantity of rainfall in that region may make their own deductions, the actual monthly averages for each station are given, together with the assumed correction for each month, and the final corrected value for the fundamental period.

The precipitation for the region under discussion is fairly uniform for the several seasons of the year, and appears to diminish to some extent from the coast toward the interior.

Considerable differences are shown in the average monthly and annual amounts at near-by stations, some of which are doubtless due to the natural influences of elevation and location, while others are probably due to the use of too short periods for determining the necessary corrections.

During the winter months heavy snows often accumulate to a depth of several feet, especially in the wooded districts. With the advent of warm weather, often accompanied by copious rains, a large amount of water is frequently liberated in short periods of time, and floods are liable to occur.

The rains in the basin are as a rule not excessive, and except in the spring, when the large accumulation of snow is melting, there are few floods in the streams.

Despite the fact that this portion of Maine is directly in the course of nearly all the storms passing across the United States, the annual amounts of precipitation are subject to wide fluctuations, as shown by the records maintained at the Orono station.

It is worthy of note also that these variations are largely similar for groups of years; thus from 1869 to 1879 the yearly amounts were almost continuously near or above the average; from 1880 to 1883 the amounts were continuously below the normal. Likewise from 1884 to 1891 the yearly amounts were again continuously above the normal, and from 1892 to 1897 they were equally below the normal, the difference between the means of the last two periods amounting to more than 14 inches with an extreme range of 30 inches.

Dividing the period of 42 years into two groups we find that from 1869 to 1891, inclusive, 23 years, the precipitation was, as a rule, considerably above the average for the entire period, the total excess amounting to about 67 inches. During the period 1892 to 1910, inclusive, 19 years, the precipitation with few exceptions has been continuously below the average for the whole period, the total deficiency amounting to about 65 inches.

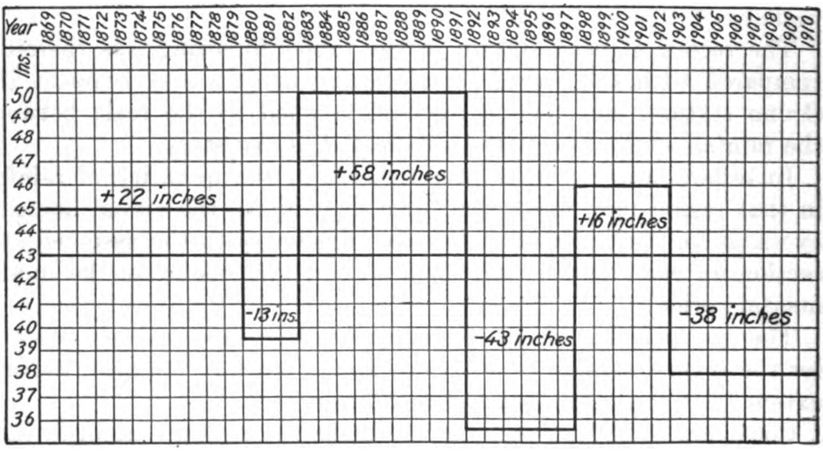


FIGURE 1.—Diagram showing precipitation at Orono, Me., 1869-1910.

The accompanying chart, figure 1, showing the periods of excess and deficiency, illustrates graphically the periodic variations that may be expected in the rainfall of this region. Figure 2 shows the mean annual precipitation and mass curve of precipitation at Orono.

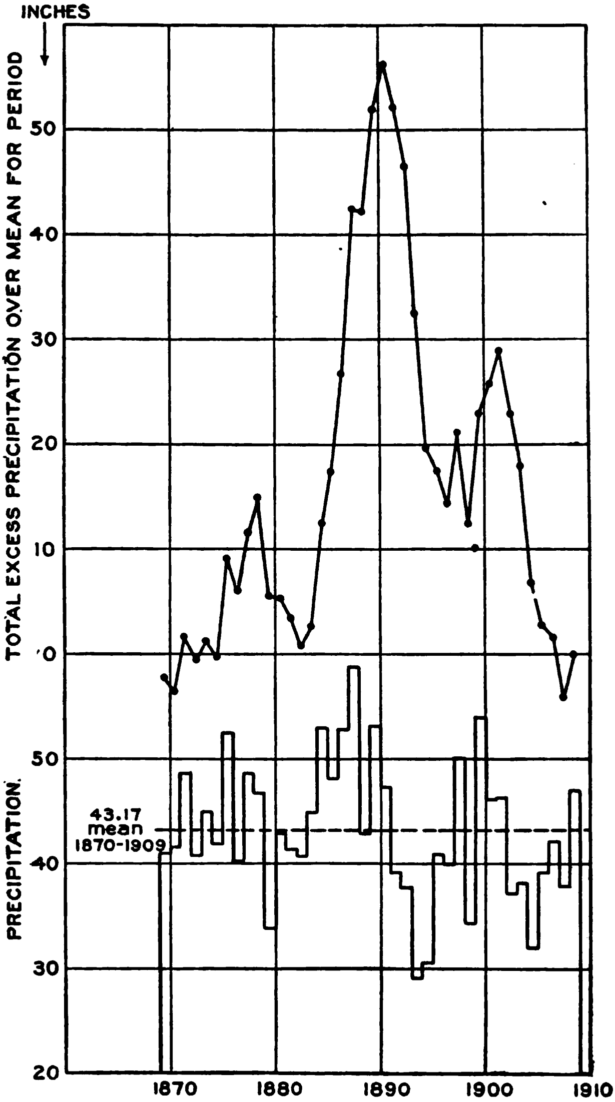


FIGURE 2.—Mean annual precipitation and mass curve of precipitation at Orono.

Precipitation at stations in Maine, 1885-1910.

BAR HARBOR, 1885-1910.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1885	......	......	......	......	......	......	......	......	......	......	3.88	4.20	......
1886	8.29	5.89	3.28	1.07	3.90	1.75	1.51	1.44	2.58	2.58	5.74	3.30	42.33
1887	8.22	7.29	5.03	4.81	1.11	2.58	3.48	6.61	0.60	3.53	3.85	5.11	52.22
1888	4.81	4.77	4.02	3.00	3.67	1.53	3.24	4.29	6.36	7.84	7.60	5.98	57.11
1889	4.83	3.88	4.42	2.81	1.79	2.04	2.07	1.17	1.65	5.86	6.25	5.92	42.69
1890	3.64	3.64	6.31	1.82	10.81	3.15	0.99	5.93	4.25	3.12	2.59	6.13	52.38
1891	7.21	4.68	5.18	2.87	1.57	3.73	4.36	2.45	2.15	4.76	3.12	4.40	46.48
1892	[a] *6.65*	*2.41*	*3.36*	1.34	2.25	4.43	1.01	5.09	1.79	1.17	5.11	2.33	*36.94*
1893	3.34	3.59	1.72	3.64	4.25	2.17	3.57	4.14	3.18	4.66	2.23	7.19	43.68
1894	3.46	1.47	1.46	1.59	4.33	1.50	1.99	1.65	4.17	4.96	*2.70*	*3.24*	*32.52*
1895	*6.25*	*1.60*	*3.60*	*3.50*	1.59	1.63	1.79	2.64	2.29	1.42	9.73	3.08	*39.12*
1896	1.47	5.50	6.32	1.19	2.96	2.39	6.05	2.90	6.04	5.85	5.10	2.60	48.37
1897	4.82	2.29	3.54	2.75	6.36	4.00	5.62	8.22	2.33	0.35	9.25	4.35	53.88
1898	6.45	9.15	2.95	4.85	2.45	3.27	1.70	2.92	3.55	9.25	8.35	3.60	58.49
1899	5.52	4.05	7.15	1.09	2.25	1.36	6.55	0.75	3.80	3.05	5.65	2.57	43.79
1900	11.15	6.20	8.57	3.15	6.07	3.52	1.65	1.90	3.15	6.77	5.48	2.43	60.04
1901	4.83	1.63	10.30	5.81	2.74	3.23	1.63	3.00	3.28	3.45	3.50	9.78	53.18
1902	4.05	3.83	14.37	3.07	2.52	7.60	1.75	3.24	2.50	5.11	1.79	7.12	56.95
1903	5.83	5.20	10.05	3.65	1.65	3.23	3.25	0.75	1.68	5.28	3.97	3.35	47.99
1904	5.37	4.05	5.37	5.02	4.62	1.40	1.72	5.24	9.81	2.55	2.25	4.63	52.03
1905	5.20	3.20	1.06	0.95	3.20	4.54	3.35	2.56	7.79	2.10	7.22	7.61	48.77
1906	4.46	2.70	8.10	4.33	4.78	2.25	2.28	0.75	1.40	4.40	4.10	4.55	44.10
1907	3.00	3.45	2.00	5.30	2.90	4.48	3.05	2.37	5.90	4.90	5.30	5.75	48.40
1908	5.39	5.88	3.40	3.25	3.75	1.65	3.50	2.23	2.25	5.65	1.69	5.95	44.59
1909	7.10	6.07	5.85	5.11	4.28	1.15	2.66	1.53	8.35	1.81	5.77	2.03	51.71
1910	3.30	5.40	3.10	5.17	1.75	4.15	1.00	2.65	1.12	1.01	2.00	4.25	34.90
Average [b]	5.43	4.32	5.22	3.25	3.50	2.91	2.79	3.06	3.68	4.06	4.97	4.86	48.05
Correction [c]	−.31	+.04	−.05	+.12	+.01	−.01	+.14	+.10	−.16	+.47	+.22	+.08	+0.65
Corrected average [d]	5.12	4.36	5.17	3.37	3.51	2.90	2.93	3.16	3.52	4.53	5.19	4.94	48.70

BELFAST, 1891-1904.

1891	......	......	......	......	......	3.33	4.16	3.32	1.55	2.97	3.02	5.10	......
1892	5.65	2.61	2.77	0.93	2.71	4.50	1.62	5.38	2.70	1.26	4.86	1.70	36.69
1893	3.99	4.84	2.05	3.21	5.29	2.73	2.99	3.82	4.35	4.48	2.46	7.45	47.66
1894	4.37	3.65	1.58	1.63	5.86	1.98	4.46	4.72	4.61	5.56	2.52	3.83	44.77
1895	6.53	1.15	3.06	4.03	2.05	3.19	1.94	1.96	1.43	1.82	7.29	4.63	39.08
1896	0.98	5.01	7.30	1.18	3.03	2.21	5.19	5.02	10.32	3.25	4.25	1.40	49.14
1897	3.98	2.32	4.65	2.90	5.02	3.08	3.19	3.92	2.09	0.90	5.75	3.50	41.30
1898	5.81	11.35	2.48	4.67	1.28	4.69	1.38	2.31	3.17	8.35	5.59	2.96	54.04
1899	3.73	2.76	5.86	1.79	2.25	2.09	4.73	0.50	4.80	3.03	2.94	2.90	37.38
1900	5.68	8.19	7.31	2.26	7.18	4.34	[a] *2.08*	*1.80*	3.05	5.04	5.41	1.68	*54.02*
1901	4.51	2.16	7.80	6.49	2.09	0.88	3.10	3.64	2.50	3.53	3.11	9.74	49.55
1902	3.37	2.59	12.70	3.00	1.85	6.38	1.52	4.62	1.84	5.05	1.34	4.90	49.16
1903	4.96	5.13	8.94	1.45	0.53	3.51	4.12	2.69	0.84	3.99	2.46	4.26	42.88
1904	4.86	1.84	3.14	5.06	6.51	1.03	1.23	4.66	6.30	2.91	*2.05*	*3.40*	*42.97*
Average [b]	4.49	4.12	5.36	2.97	3.51	3.14	2.92	3.45	3.54	3.72	3.79	4.10	45.11
Corrected [c]	+.32	+.52	−.14	+.31	+.22	−.05	+.17	−.10	+.26	+.48	+.66	+.40	+3.05
Corrected average [d]	4.81	4.64	5.22	3.28	3.73	3.09	3.09	3.35	3.80	4.20	4.45	4.50	48.16

CARMEL, 1900-1902.

1900	[a] *5.75*	5.01	7.10	1.91	7.25	3.62	3.14	1.46	3.10	4.15	3.36	1.99	*47.84*
1901	6.67	1.90	3.75	4.92	2.95	1.95	3.00	2.91	3.58	3.56	2.40	*7.94*	*45.53*
1902	*3.05*	2.42	10.97	2.51	2.94	5.57	4.02	3.08	2.06	3.71	2.02	2.45	*44.80*
Average [b]	5.16	3.11	7.27	3.11	4.38	3.71	3.39	2.48	2.91	3.81	2.59	4.13	46.05
Corrected [c]	−1.39	+.23	−2.67	−.55	−1.00	−.52	+.78	−.06	+.54	−.97	+.91	−1.22	−5.92
Corrected average [d]	3.77	3.34	4.60	2.56	3.38	3.19	4.17	2.42	3.45	2.84	3.50	2.91	40.13

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[a] Interpolated values in italic.

[b] Average for period.

[c] Correction necessary to reduce record to the 42-year period from 1869 to 1910, inclusive, covered by the Orono record.

[d] Corrected average for the 42-year period, 1869-1910.

Precipitation at stations in Maine, 1885–1910—Continued.

CHESUNCOOK, 1904–1906.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1904	1.78	0.80	2.11	2.52	3.49	2.75	4.23	5.44	7.71	1.70	1.57	0.59	34.69
1905	2.67	0.69	1.32	0.71	2.42	1.65	1.52	1.28	1.18	0.77	3.15	2.22	19.58
1906	1.94	1.61	4.94	2.33	2.74	3.10	0.60	0.91	3.10	2.25	......	......	....
Average [a]	2.13	1.03	2.79	1.85	2.88	2.50	2.12	2.54	4.00	1.57	2.36	1.40	27.17
Corrected [b]	+.31	+1.38	+1.29	+.08	−1.03	+.64	+.78	+.61	−.15	+1.05	+1.02	+.93	+6.91
Corrected average [c]	2.44	2.41	4.08	1.93	1.85	3.14	2.90	3.15	3.85	2.62	3.38	2.33	34.08

CHESUNCOOK DAM, 1905–1909.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1905	......	......	......	......	......	3.02	1.85	0.50	2.67	0.92	2.38	3.02	....
1906	2.44	2.14	5.79	2.56	3.28	2.59	2.74	1.69	2.65	6.06	2.29	3.45	37.68
1907	2.06	1.41	2.10	3.77	2.39	4.41	6.76	2.49	3.38	3.96	3.36	3.24	39.33
1908	2.16	3.02	1.85	1.94	4.58	1.82	3.66	5.28	1.26	2.40	1.67	1.45	31.09
1909	3.02	2.98	3.63	3.23	1.94	2.17	3.70	3.94	[d] 9.84	[d] 1.18	3.20	1.93	40.74
Average [a]	2.42	2.39	3.44	2.88	3.05	2.80	3.74	2.78	3.96	2.90	2.58	2.62	35.56
Corrected [b]	−.11	+.02	+.39	−.68	−.14	+.32	+.48	+1.02	−.57	+.61	+.40	+.56	+2.30
Corrected average [c]	2.31	2.41	3.83	2.20	2.91	3.12	4.22	3.80	3.39	3.51	2.98	3.18	37.86

DANFORTH, 1902–1910.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1902	......	......	......	......	......	......	......	......	......	......	0.95	3.71	....
1903	2.94	3.92	5.05	2.55	0.65	3.72	4.10	2.46	1.42	3.62	3.59	3.16	37.18
1904	2.95	2.89	3.48	2.86	4.31	1.76	2.56	3.02	6.23	2.66	2.35	1.51	36.58
1905	5.75	2.43	1.01	1.40	2.23	1.80	3.48	0.53	3.75	1.00	3.66	3.55	30.59
1906	3.95	2.22	4.94	4.88	2.40	2.57	2.21	2.79	1.41	4.73	5.56	3.32	40.98
1907	2.77	5.12	2.87	3.05	1.76	3.59	4.27	4.04	4.13	3.88	3.48	3.06	42.02
1908	2.91	5.02	2.32	2.60	4.11	1.60	2.93	4.10	1.28	6.81	1.49	2.57	37.74
1909	5.98	4.12	4.23	4.20	1.58	3.30	2.02	2.95	7.10	2.14	3.92	2.34	43.88
1910	2.91	2.48	0.35	1.85	2.40	3.57	3.55	1.93	1.80	1.62	3.28	1.35	27.09
Average [a]	3.77	3.52	3.03	2.92	2.43	2.74	3.14	2.73	3.39	3.31	3.14	2.73	36.85
Corrected [b]	+.05	+.42	+.71	−.06	+.37	+.59	+.06	+.60	+.67	+.74	+1.10	+.53	+5.78
Corrected average [c]	3.82	3.94	3.74	2.86	2.80	3.33	3.20	3.33	4.06	4.05	4.24	3.26	42.63

DEBSCONEAG, 1905–1909.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1905	......	......	......	......	......	......	4.80	1.10	2.92	1.31	4.28	[e] *3.57*	....
1906	2.71	2.20	5.55	3.69	3.53	2.38	3.25	3.16	2.89	7.43	2.87	3.25	42.91
1907	2.85	1.75	2.80	3.80	1.30	7.57	5.85	2.30	6.10	4.50	*3.75*	3.44	*46.01*
1908	......	......	......	......	......	......	......	......	......	......	......	......	....
1909	......	......	......	......	......	......	2.60	3.04	10.27	2.87	......	......	....
Average [a]	2.78	1.98	4.18	3.74	2.42	4.98	4.12	2.40	5.54	4.03	3.63	3.42	43.22
Corrected [b]	+.42	+1.09	+.77	−.78	−.24	−.96	+.52	+1.61	−1.41	+1.28	−.07	+.12	+2.35
Corrected average [c]	3.20	3.07	4.95	2.96	2.18	4.02	4.64	4.01	4.13	5.31	3.56	3.54	45.57

[a] Average for period.

[b] Correction necessary to reduce record to the 42-year period from 1869 to 1910, inclusive, covered by the Orono record.

[c] Corrected average of the 42-year period, 1869–1910.

[d] Record from Sept. 19 to Oct. 13 from Millinocket.

[e] Interpolated values in italic.

Precipitation at stations in Maine, 1885–1910—Continued.

FAIRFIELD, 1886–1908.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1886	......	3.61	1.75	1.36	3.04	1.04	1.71	2.06	4.76	1.83	5.08	2.26	....
1887	2.39	2.62	2.05	3.64	0.41	2.84	8.77	2.98	1.11	1.93	3.40	3.44	35.66
1888	1.91	3.27	3.84	1.07	3.18	......	3.60	3.56	6.75	5.44	......	3.11	....
1889	2.91	2.12	3.09	1.06	2.54	4.25	3.11	1.74	1.95	3.57	5.13	4.26	35.73
1890	2.55	3.31	4.61	1.71	7.79	2.97	3.81	3.57	3.85	3.45	2.06	3.39	43.07
1891	6.12	2.23	4.75	1.97	2.26	2.03	4.63	4.00	2.06	1.38	2.14	4.56	38.13
1892	3.38	2.28	1.82	0.80	2.67	5.79	1.78	5.58	3.27	1.37	3.16	1.10	33.00
1893	1.62	2.77	2.49	2.13	3.42	0.99	2.27	2.90	2.12	4.89	0.86	2.36	28.82
1894	2.43	1.03	0.86	0.72	3.78	2.97	2.56	3.50	3.82	2.41	2.02	1.82	27.92
1895	2.23	0.34	1.58	3.50	1.83	1.96	3.08	2.59	1.11	1.58	5.47	3.77	29.04
1896	0.31	2.95	5.62	1.28	2.33	1.91	3.21	3.83	5.10	2.00	2.35	1.17	32.06
1897	3.31	1.00	2.63	2.40	4.47	3.39	3.52	2.82	2.54	0.53	3.98	3.06	33.65
1898	5.07	6.48	1.45	2.31	1.55	3.32	1.13	3.71	2.37	4.33	3.71	1.42	36.85
1899	2.76	2.73	3.66	1.05	2.05	1.39	5.13	0.46	3.58	1.11	2.32	1.93	28.17
1900	5.89	7.00	4.75	1.63	5.18	4.08	3.40	1.76	2.55	4.05	4.55	2.19	47.03
1901	2.74	1.95	5.22	3.96	2.35	1.64	2.99	3.39	3.79	2.77	2.19	7.98	40.97
1902	2.25	1.54	7.76	2.41	2.54	4.04	2.22	4.06	1.86	4.01	1.03	4.68	38.40
1903	3.94	3.39	6.35	1.95	0.37	3.56	......	......	......	......	1.06	2.70	....
1904	3.21	1.65	3.78	5.75	4.75	2.32	2.69	4.39	5.58	2.05	1.61	1.44	39.22
1905	3.78	0.99	0.88	2.15	2.22	3.49	3.65	1.43	2.45	0.38	3.80	3.19	28.41
1906	2.59	2.52	......	3.69	3.55	3.29	5.32	4.78	1.55	5.38	2.63	3.55	....
1907	3.19	2.65	1.43	3.49	2.62	2.95	5.36	1.32	5.23	2.34	3.66	2.68	36.92
1908	1.61	3.68	1.77	1.93	4.52	2.17	2.41	3.05	0.56	3.64	1.15	2.07	28.56
Average [a]	3.01	2.70	3.28	2.26	3.02	2.84	3.29	3.07	3.04	2.75	2.88	2.96	35.10
Corrected [b]	− 17	+ .10	− .09	+ .20	− .12	− .08	+ .24	+ .01	− .07	+ .37	+ .35	+ .07	+ 0.81
Corrected average [c]	2.84	2.80	3.19	2.46	2.90	2.76	3.53	3.08	2.97	3.12	3.23	3.03	35.91

GREENVILLE, 1904–1910.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1904	......	......	......	......	5.27	3.60	6.85	4.09	7.63	2.44	0.47	......	....
1905	......	......	......	1.91	3.22	3.99	2.52	1.43	2.82	0.86	2.51	1.22	....
1906	1.20	1.23	[d] *4.58*	2.20	4.72	3.43	6.28	2.88	2.73	5.80	1.85	3.75	*40.65*
1907	0.98	1.30	2.56	3.78	2.54	6.90	5.81	2.68	5.64	*4.42*	*3.72*	3.12	*45.46*
1908	2.63	4.93	2.95	2.14	5.50	2.83	5.18	7.96	1.90	2.08	1.92	2.59	42.61
1909	4.51	4.80	4.76	4.22	2.72	3.60	3.34	3.00	10.12	1.73	4.57	2.59	49.96
1910	3.43	3.51	2.18	2.51	4.65	5.31	4.18	3.69	2.77	2.13	3.21	2.64	40.21
Average [a]	2.55	3.15	3.41	2.79	4.09	4.24	4.88	3.68	4.80	2.78	2.61	2.65	41.63
Corrected [b]	0	+ .08	+ .74	− .35	+ .05	+ .49	+ .54	+ .52	− .71	+ .76	+ .96	+ .52	+ 3.60
Corrected average [c]	2.55	3.23	4.15	2.44	4.14	4.73	5.42	4.20	4.09	3.54	3.57	3.17	45.23

[a] Average for period.

[b] Correction necessary to reduce this record to the 42-year period from 1869 to 1910, inclusive, covered by the Orono record.

[c] Corrected average for the 42-year period, 1869–1910.

[d] Interpolated values in italic.

Precipitation at stations in Maine, 1885–1910—Continued.

HOULTON, 1892–1910.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1892	......	1.74	2.15	0.87	2.12	6.54	3.78	5.74	3.65	1.78	3.50	1.42	....
1893	3.27	3.49	0.99	1.57	1.30	......	3.91	2.98	4.03	3.90	0.85	3.57	....
1894	2.54	1.75	1.52	0.72	3.05	4.07	3.78	2.22	2.48	4.89	3.18	3.73	33.93
1895	2.55	1.30	......	3.55	1.30	3.65	2.43	3.10	1.11	1.70	5.78	4.50	....
1896	0.85	3.00	......	......	......	......	......	......	......	......	......	......	....
1902	......	......	......	1.25	2.87	8.06	3.28	4.09	4.10	4.73	1.88	4.62	....
1903	3.14	2.68	5.49	2.50	0.30	2.45	2.78	1.55	1.15	2.40	2.62	2.00	29.06
1904	4.60	2.35	2.60	2.80	3.65	2.52	2.58	3.00	6.70	3.40	2.20	1.44	37.84
1905	3.55	1.60	0.70	1.25	2.00	1.50	1.45	0.12	1.80	1.00	2.25	2.40	19.62
1906	2.70	2.10	3.20	3.20	2.00	1.40	2.55	1.50	1.20	*7.34*	1.20	*2.48*	*30.87*
1907	1.90	1.50	1.70	1.75	1.00	4.20	[a] *3.08*	3.22	5.00	3.10	2.10	2.00	*30.55*
1908	1.89	4.75	2.51	2.25	2.20	2.00	1.30	3.57	0.49	1.35	1.07	1.50	24.88
1909	3.64	3.70	2.95	4.09	*1.54*	3.20	2.15	1.65	6.14	1.25	2.34	2.05	*34.70*
1910	0.95	2.00	1.40	2.66	3.75	2.50	2.17	1.07	0.85	1.65	1.42	0.87	21.29
Average [b]	2.63	2.46	2.29	2.19	2.08	3.51	2.71	2.60	2.98	2.96	2.34	2.51	31.26
Corrected [c]	+ .75	+ .73	+1.16	+ .17	+ .50	+ .16	+ .30	+ .17	− .08	+ .76	+1.12	+ .56	+ 6.30
Corrected average [d]	3.38	3.19	3.45	2.36	2.58	3.67	3.01	2.77	2.90	3.72	3.46	3.07	37.56

KINEO, 1895–1903.

1895	2.11	1.35	1.22	2.03	2.58	3.26	4.07	4.90	1.45	0.87	5.47	2.99	32.30
1896	0.37	2.51	4.49	2.24	2.46	2.47	4.02	2.00	3.27	3.61	1.95	0.90	30.29
1897	2.82	1.95	2.43	3.27	3.96	2.59	8.37	3.11	2.62	1.52	2.69	2.25	37.58
1898	4.24	6.90	0.82	2.22	......	......	0.90	3.30	4.50	......	......	......	....
1899	......	......	......	......	3.20	3.94	7.37	......	......	......	......	......	....
1900	5.17	3.47	3.90	......	3.49	3.24	5.21	1.51	2.55	......	......	......	....
1901	2.65	1.80	1.45	4.85	0.75	6.55	1.95	2.55	0.94	2.26	2.70	7.40	35.85
1902	2.15	3.60	4.73	2.65	4.67	6.15	4.03	3.01	5.46	......	0.81	2.01	....
1903	2.36	......	4.99	......	......	2.79	......	......	......	......	......	......	....
Average [e]	2.73	3.08	3.00	2.88	3.02	3.87	4.49	2.91	2.97	2.06	2.72	3.11	36.84
Corrected [c]	− .09	+ .29	−.113	− .57	− .43	+ .17	+ .46	− .19	+ .27	+1.38	+ .43	− .63	− 0.04
Corrected average [d]	2.64	3.37	1.87	2.31	2.59	4.04	4.95	2.72	3.24	3.44	3.15	2.48	36.80

[a] Interpolated values in italic.

[b] Average for record entered on this sheet.

[c] Correction necessary to reduce this record to the 42-year period from 1869 to 1910, inclusive, covered by the Orono record.

[d] Corrected average for the 42-year period, 1869–1910.

[e] Average for period.

Precipitation at stations in Maine, 1885–1910—Continued.

MAYFIELD, 1886–1908.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1885	......	......	......	......	......	9.03	2.91	3.70	2.79	3.50	3.40	3.09	......
1886	8.06	4.12	2.85	1.40	3.76	1.26	2.58	3.74	3.93	2.33	6.82	......	......
1887	......	......	......	5.91	2.08	4.01	6.53	3.35	1.41	2.74	4.27	......	......
1888	......	......	......	1.42	3.17	2.27	3.48	6.88	5.90	7.93	6.90	3.25	......
1889	......	......	......	2.09	3.66	5.70	4.98	3.35	6.52	5.83	5.39	......	......
1890	......	......	......	2.42	10.29	3.97	3.45	6.40	5.85	3.45	2.01	......	......
1891	......	......	......	3.75	2.37	3.34	5.11	4.78	1.58	1.56	2.91	......	......
1892	4.80	2.14	2.89	......	......	8.36	2.73	9.19	5.63	1.60	5.14	0.95	......
1893	2.47	1.83	2.36	1.86	5.65	2.69	3.27	5.20	4.21	7.37	3.49	3.02	43.42
1894	3.15	1.61	1.31	1.17	4.83	6.45	2.65	2.05	5.71	6.41	2.48	2.27	40.09
1895	2.31	1.08	1.25	6.21	3.83	3.03	4.44	3.86	2.09	2.25	7.63	5.84	43.82
1896	0.94	3.58	7.20	2.34	3.02	3.13	6.07	4.90	5.31	4.77	5.11	1.24	47.61
1897	3.99	2.07	3.92	4.56	5.04	3.41	8.04	4.07	3.01	1.43	5.12	3.43	48.09
1898	4.22	7.99	0.96	2.26	1.88	2.94	1.52	4.43	3.57	5.79	6.02	1.14	42.72
1899	2.50	4.00	4.87	0.99	3.02	2.04	4.79	1.05	3.33	1.71	2.19	3.05	33.54
1900	6.27	7.39	5.65	1.57	5.84	3.31	4.48	1.25	3.26	2.99	7.43	1.10	50.54
1901	2.60	1.20	5.55	6.33	2.26	2.94	5.40	5.25	2.63	3.43	2.44	8.63	48.66
1902	3.21	3.60	9.50	4.16	3.40	7.39	2.95	6.36	4.33	5.83	1.65	4.12	56.50
1903	5.48	3.27	5.33	1.56	0.58	6.54	5.27	3.03	0.85	3.12	1.61	3.06	39.70
1904	3.07	1.81	2.76	3.42	6.86	3.17	4.41	5.32	5.73	2.42	1.58	1.47	42.02
1905	4.25	[a]*1.11*	1.00	2.17	3.29	3.39	4.39	1.86	4.40	0.96	2.87	2.69	32.38
1906	2.69	2.01	5.24	2.70	3.90	4.61	4.66	4.13	2.23	5.54	3.61	3.38	44.70
1907	1.40	1.72	1.86	4.04	2.40	4.64	4.75	3.18	5.67	6.11	5.35	5.42	46.54
1908	3.64	......	......	......	......	......	......	......	......	......	......	......	......
Average[b]	3.61	2.97	3.79	2.97	3.86	4.24	4.30	4.23	3.92	3.87	4.15	3.18	45.09
Corrected[c]	+ .14	+ .52	+ .25	+ .12	− .14	− .06	+ .01	− .06	− .04	+ .42	+ .05	+ .21	+ 1.42
Corrected average[d]	3.75	3.49	4.04	3.09	3.72	4.18	4.31	4.17	3.88	4.29	4.20	3.39	46.51

MILLINOCKET, 1899–1910.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1899	......	......	......	......	1.14	3.80	4.08	0.57	4.08	3.80	1.14	3.31	......
1900	6.45	9.41	6.24	1.63	6.41	3.96	6.53	1.73	2.02	6.11	3.77	0.91	55.17
1901	2.53	0.59	5.11	5.63	0.94	3.02	1.78	4.59	1.85	3.68	2.55	8.75	41.02
1902	3.97	0.96	6.47	1.95	2.47	5.82	2.50	3.63	4.15	5.09	1.88	5.23	44.02
1903	3.34	3.30	6.39	1.96	0.72	2.07	4.25	2.48	2.82	2.72	2.64	3.64	36.33
1904	3.35	1.89	3.86	2.82	4.38	2.16	4.96	4.06	6.46	3.21	2.20	1.89	41.24
1905	5.45	1.25	0.77	2.05	2.91	2.41	2.92	2.08	3.47	1.49	4.29	3.57	32.66
1906	3.09	3.45	6.29	3.69	3.57	2.96	3.24	1.90	3.16	7.10	4.21	3.35	46.01
1907	3.24	1.95	2.16	3.60	2.50	7.33	4.70	4.04	5.31	4.14	3.75	3.32	46.04
1908	2.52	3.82	2.65	1.93	5.16	2.10	2.35	5.01	2.46	3.30	1.88	3.32	36.50
1909	5.24	5.36	4.24	4.64	3.05	2.91	3.09	3.07	9.70	1.80	4.92	2.07	50.09
1910	4.05	3.56	1.66	4.27	2.97	4.37	3.72	2.39	2.61	2.21	2.86	2.96	37.63
Average[b]	3.93	3.23	4.17	3.11	3.02	3.58	3.68	2.96	4.01	3.72	3.01	3.53	41.95
Corrrected[c]	−.34	+.37	−.17	−.19	−.06	+.20	+.12	+.67	−.05	+.34	+1.03	+.23	+2.15
Corrected average[d]	3.59	3.60	4.00	2.92	2.96	3.78	3.80	3.63	3.96	4.06	4.04	3.76	44.10

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[a] Interpolated values in italic.

[b] Average for period.

[c] Correction necessary to reduce record to the 42-year period from 1869 to 1910, inclusive, covered by the Orono record.

[d] Corrected average for the 42-year period, 1869–1910.

Precipitation at stations in Maine, 1885–1910—Continued.

ORONO, 1869–1910.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual
1869	2.54	4.26	3.36	2.39	2.95	[a] *4.00*	1.62	1.91	3.67	9.57	3.36	[a] *7.50*	[a] *47.13*
1870	5.61	4.30	2.11	3.55	1.96	2.07	1.78	3.21	2.23	5.53	5.61	3.04	41.00
1871	2.60	2.53	4.11	3.91	3.63	2.58	1.98	3.85	1.10	7.50	3.58	4.16	41.53
1872	2.18	1.70	5.23	1.93	3.92	4.47	2.68	6.23	3.55	6.01	7.06	3.66	48.62
1873	4.09	2.97	4.70	2.59	1.96	1.32	3.26	1.81	4.74	6.56	5.05	1.74	40.79
1874	4.57	5.50	3.40	3.76	4.74	4.93	2.10	5.39	4.37	1.14	3.06	1.98	44.94
1875	2.00	3.80	4.45	3.85	3.31	4.85	2.11	2.32	5.10	4.75	3.87	1.51	41.92
1876	3.92	8.39	8.20	1.65	3.73	2.56	5.80	0.91	4.28	3.91	4.35	4.67	52.37
1877	3.29	1.20	5.67	3.18	1.94	1.98	1.64	5.28	1.11	4.78	7.95	2.15	40.17
1878	5.08	2.41	2.73	3.46	2.14	5.42	4.77	3.00	2.00	4.73	4.91	7.92	48.57
1879	3.28	3.56	3.40	3.51	1.80	4.73	5.79	5.66	4.93	3.49	2.98	3.60	46.73
1880	2.83	2.83	2.86	4.15	2.17	0.73	3.32	1.54	3.84	4.15	3.52	1.90	33.84
1881	2.08	3.35	3.64	1.28	4.85	3.38	2.72	5.89	2.35	3.57	2.81	6.88	42.80
1882	4.19	3.96	5.20	2.05	4.52	4.44	3.10	1.64	6.44	1.09	1.78	2.85	41.26
1883	2.44	2.34	1.89	3.80	5.10	3.66	6.90	0.53	2.23	4.97	3.75	2.99	40.60
1884	4.44	6.85	4.37	3.38	5.42	1.37	2.38	3.12	2.19	2.70	3.99	4.74	44.95
1885	4.73	4.45	2.78	2.34	3.38	4.60	4.70	7.36	2.52	5.12	5.37	5.64	52.99
1886	6.64	5.42	2.87	1.80	4.67	2.74	1.05	2.27	4.11	1.42	8.67	6.38	48.04
1887	7.56	5.89	5.88	5.08	1.25	3.36	7.11	4.60	0.95	3.00	3.48	4.72	52.88
1888	4.97	6.11	6.48	1.78	2.82	3.65	2.47	4.59	6.97	7.51	6.43	4.96	58.74
1889	5.37	5.20	4.62	1.93	1.86	4.93	3.23	1.65	2.21	4.04	4.50	3.40	42.94
1890	3.33	4.52	5.81	2.02	10.52	3.84	3.84	4.55	4.47	3.36	2.67	4.10	53.03
1891	7.66	2.93	5.20	3.26	2.83	3.20	3.56	4.67	3.68	2.85	2.78	4.76	47.38
1892	4.80	1.96	2.52	1.12	1.94	5.96	1.99	6.41	3.91	1.75	4.47	2.26	39.09
1893	0.85	5.75	1.45	2.18	2.55	2.69	3.25	3.90	6.02	3.34	1.43	4.21	37.62
1894	3.01	1.73	1.23	1.18	3.84	2.90	2.41	2.01	3.40	4.33	1.24	1.75	29.03
1895	[a] *2.75*	0.83	2.39	3.88	2.13	1.35	2.85	2.14	1.05	1.51	3.61	[a] *4.00*	[a] *28.49*
1896	[a] *0.75*	2.20	6.95	1.35	2.69	2.62	2.58	4.26	8.00	3.75	4.23	1.30	[a] *40.68*
1897	3.03	2.38	3.96	3.03	4.49	3.71	2.02	5.09	2.65	1.01	5.04	3.58	39.99
1898	6.32	8.05	2.23	4.95	1.02	5.28	2.44	3.14	2.29	6.19	6.84	1.27	50.02
1899	2.75	2.27	4.76	0.66	4.12	4.10	4.49	T.	3.20	2.92	2.01	3.09	34.37
1900	8.14	6.75	5.47	2.01	8.24	3.83	2.53	1.58	2.94	5.70	4.59	2.02	53.80
1901	4.33	1.95	5.45	5.12	2.07	1.79	2.75	3.76	4.22	4.12	2.54	7.94	46.04
1902	3.65	1.80	8.89	2.94	2.77	6.03	1.81	4.96	1.94	5.04	1.76	4.77	46.36
1903	3.62	3.48	6.22	1.71	0.73	2.09	6.49	2.22	1.21	3.44	2.79	3.14	37.14
1904	3.63	2.57	3.18	2.31	4.26	2.17	2.43	4.46	6.47	3.10	1.62	2.00	38.20
1905	4.28	2.20	0.83	2.22	3.47	3.13	2.19	2.13	3.19	0.78	4.08	3.51	32.01
1906	3.11	2.27	4.34	3.65	5.44	2.86	2.47	1.69	1.51	4.90	3.52	3.37	39.13
1907	4.01	3.01	2.25	3.53	1.77	5.77	3.44	1.41	6.12	2.71	4.22	3.84	42.08
1908	3.36	4.23	2.90	2.37	4.59	1.35	2.85	4.69	0.81	6.03	1.39	2.94	37.51
1909	5.87	5.32	5.23	4.41	2.21	2.11	2.37	1.82	9.09	2.43	4.14	1.98	46.99
1910	3.57	3.42	1.91	2.76	1.42	2.70	2.43	3.72	2.79	2.56	1.42	2.88	31.58
Mean	3.98	3.73	4.07	2.81	3.36	3.36	3.14	3.37	3.57	3.98	3.87	3.69	42.93

PATTEN, 1902–1910.

1902	......	......	......	1.00	3.52	6.20	3.00	3.80	4.30	4.80	[a] *1.75*	2.20	....
1903	1.60	[a] *2.84*	3.02	[a] *2.03*	0.12	2.29	4.03	2.64	0.69	2.58	2.42	3.40	[a] *27.66*
1904	2.90	[a] *2.05*	1.02	2.90	4.25	4.15	4.30	2.49	10.42	3.10	1.82	1.50	[a] *40.90*
1905	4.20	0.90	0.90	2.50	2.15	5.25	2.00	0.06	3.96	1.38	3.30	2.00	28.60
1906	3.50	3.80	5.90	2.40	1.30	1.84	5.26	1.57	1.52	10.10	1.88	2.73	41.80
1907	1.00	2.40	1.40	1.50	2.05	10.04	4.21	5.00	6.04	5.70	5.30	4.00	48.64
1908	......	......	......	......	......	......	1.51	5.00	0.30	......	......	1.55	....
1909	5.80	4.75	4.16	5.14	1.79	2.50	6.42	3.91	9.71	2.38	4.19	1.95	52.70
1910	3.10	3.34	0.93	5.35	6.68	4.28	4.27	2.28	4.63	2.98	2.36	2.73	42.93
Average [b]	3.16	2.87	2.48	2.85	2.73	4.57	3.89	2.97	4.62	4.13	2.88	2.45	39.60
Corrected [c]	−.03	+.55	+.65	−.13	+.60	+.08	+.20	+.36	−.11	+.86	+.93	+.53	+4.49
Corrected average [d]	3.13	3.42	3.13	2.72	3.33	4.65	4.09	3.33	4.51	4.99	3.81	2.98	44.09

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[a] Interpolated values in italic.

[b] Average for period.

[c] Correction necessary to reduce record to the 42-year period from 1869 to 1910, inclusive, covered by the Orono record.

[d] Corrected average for the 42-year period, 1869–1910.

Precipitation at stations in Maine, 1885–1910—Continued.

SOUTH LAGRANGE, 1903-1905.

Year.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
1903	......	......	......	......	......	......	......	......	......	2.99	1.85	2.51	....
1901	2.10	1.50	3.60	3.03	4.85	2.62	4.77	5.10	5.93	2.40	1.92	1.75	39.57
1905	3.76	1.22	0.56	......	......	......	......	......	......	......	......	......	....
Average [a]	2.93	1.36	2.08	3.03	4.85	2.62	4.77	5.10	5.93	2.70	1.88	2.13	39.38
Corrected [b]	+.02	+1.35	+2.07	+.50	−.90	+1.19	+.71	−1.09	−2.90	+.71	+1.67	+1.12	+4.45
Corrected average [c]	2.95	2.71	4.15	3.53	3.95	3.81	5.48	4.01	3.03	3.41	3.55	3.25	43.83

THE FORKS, 1901-1910.

1901	......	......	......	......	......	......	......	......	......	3.31	2.60	8.65	....
1902	3.50	3.35	5.29	3.20	4.62	6.42	2.92	3.43	5.39	3.40	2.30	3.10	46.92
1903	2.30	3.63	4.42	1.35	0.61	4.36	4.58	3.24	0.91	1.60	1.73	2.97	31.70
1904	2.95	1.40	1.95	3.70	5.08	4.64	7.53	2.69	6.82	2.23	1.34	1.58	41.91
1905	3.39	1.11	1.30	1.68	3.58	4.33	3.37	1.86	3.47	1.24	2.90	2.40	30.63
1906	2.24	2.05	4.20	2.18	3.13	3.07	4.56	2.57	3.79	5.98	2.61	2.82	39.20
1907	1.78	2.15	2.96	5.23	2.42	4.21	8.08	2.62	5.75	4.63	4.76	2.02	46.61
1908	2.02	3.74	2.10	2.22	4.42	2.80	4.61	3.01	1.00	2.28	2.22	2.60	33.02
1909	4.36	4.04	3.85	4.65	3.14	2.22	3.50	3.35	7.56	1.00	4.34	2.05	44.06
1910	2.98	3.32	2.23	2.85	5.35	3.40	5.10	1.85	2.16	2.35	2.50	1.70	35.79
Average [a]	2.84	2.75	3.14	3.01	3.59	3.94	4.92	2.74	4.09	2.80	2.73	2.99	39.54
Corrected [b]	+0.08	+0.59	+0.10	−0.07	+0.40	+0.23	+0.20	+0.36	−0.11	+0.47	+1.12	+0.05	+3.42
Corrected average [c]	2.92	3.34	3.24	2.94	3.99	4.17	5.12	3.10	3.98	3.27	3.85	3.04	42.96

[a] Average for period.

[b] Correction necessary to reduce record to the 42-year period from 1869 to 1910, inclusive, covered by the Orono record.

[c] Corrected average for the 42-year period, 1869–1910.

Average precipitation in the Penobscot River drainage area, Maine, corrected to the period 1869 to 1910, inclusive.

Station.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Annual.
Bar Harbor	5.12	4.36	5.17	3.37	3.51	2.90	2.93	3.16	3.52	4.53	5.19	4.94	48.70
Belfast	4.81	4.64	5.22	3.28	3.73	3.09	3.09	3.35	3.80	4.20	4.45	4.50	48.16
Carmel	3.77	3.34	4.60	2.56	3.38	3.19	4.17	2.42	3.45	2.84	3.50	2.91	40.13
Chesuncook	2.44	2.41	4.08	1.93	1.85	3.14	2.90	3.15	3.85	2.62	3.38	2.33	34.08
Chesuncook Dam	2.31	2.41	3.83	2.20	2.91	3.12	4.22	3.80	3.39	3.51	2.98	3.18	37.86
Danforth	3.82	3.94	3.74	2.86	2.80	3.33	3.20	3.33	4.06	4.05	4.24	3.26	42.63
Debsconeag	3.20	3.07	4.95	2.96	2.18	4.02	4.64	4.01	4.13	5.31	3.56	3.54	45.57
Fairfield	2.84	2.80	3.19	2.46	2.90	2.76	3.53	3.08	2.97	3.12	3.23	3.03	35.91
Greenville	2.55	3.23	4.15	2.44	4.14	4.73	5.42	4.20	4.09	3.54	3.57	3.17	45.23
Houlton	3.38	3.19	3.45	2.36	2.58	3.67	3.01	2.77	2.90	3.72	3.46	3.07	37.56
Kineo	2.64	3.37	1.87	2.31	2.59	4.04	4.95	2.72	3.24	3.44	3.15	2.48	36.80
Mayfield	3.75	3.49	4.04	3.09	3.72	4.18	4.31	4.17	3.88	4.29	4.20	3.39	46.51
Millinocket	3.59	3.60	4.00	2.92	2.96	3.78	3.80	3.63	3.96	4.06	4.04	3.76	44.10
Orono	3.98	3.73	4.07	2.81	3.36	3.36	3.14	3.37	3.57	3.98	3.87	3.69	42.93
Patten	3.13	3.42	3.13	2.72	3.33	4.65	4.09	3.33	4.51	4.99	3.81	2.98	44.09
South Lagrange	2.95	2.71	4.15	3.53	3.95	3.81	5.48	4.01	3.03	3.41	3.55	3.25	43.83
The Forks	2.92	3.34	3.24	2.94	3.99	4.17	5.12	3.10	3.98	3.27	3.85	3.04	42.96
Mean	3.36	3.36	3.93	2.75	3.17	3.64	4.00	3.39	3.67	3.82	3.77	3.32	42.18

STREAM FLOW.

FIELD METHODS OF MEASURING STREAM FLOW.[1]

The flow of streams in open channels may be determined (1) by measurements of slope and cross section and the use of Chezy's and Kutter's formulas, (2) by means of a weir or dam, and (3) by measurements of the velocity of the current and of the area of the cross section. The method chosen depends on the physical conditions of the stream, on the degree of accuracy desired, on the funds available, and on the length of time that the record is to be continued. In the Penobscot River drainage basin the velocity method has been used for determining the discharge of all streams except the West Branch at Millinocket.[2]

A gaging station consists essentially of a gage for determining the daily fluctuations of stage of the river and some structure or apparatus from which discharge measurements are made, commonly a bridge or cable. The stations in the Penobscot River basin are selected and equipped with great care, in order that the data may have the required degree of accuracy.

The two factors required to determine the discharge of a stream past a section perpendicular to the mean direction of the current are the area of the cross section and the mean velocity of flow normal to that section.

Depths for the determination of the area are usually measured by sounding with the current meter and cable. The Price current meter is used by the United States Geological Survey almost to the exclusion of meters of other types to determine the velocity of flow of water in open channels. The meter consists of six cups attached to a vertical shaft which revolves on a conical hardened-steel point when immersed in moving water. The number of revolutions is indicated electrically. The relation between the velocity of the moving water and the revolutions of the wheel is determined for each meter by drawing it through still water for a given distance at different speeds and noting the number of revolutions for each run. These data form the basis of a rating table which gives the velocity of moving water per second for any number of revolutions in a given period of time.

In using a current meter the engineer marks, on the structure from which observations of depth and velocity are to be made, a number of points above and in the plane of the selected section, spacing these points equally for parts of the section in which the flow is uniform and smooth and unequally for other parts. In general, the points should not be farther apart than 5 per cent of the distance between piers, nor farther apart than the approximate mean depth at the time of measurement. The measuring points divide the total cross section into elementary strips, at each end of which depth and velocity are observed. The discharge of any elementary strip is the product of the average of the depths at the two ends times the width of the strip times the average of the mean velocities at the two ends of the strip. The sum of the discharges of the elementary strips is the total discharge of the stream.

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[1] For more complete information regarding the methods of gaging streams, see Water-Supply Paper U. S. Geol. Survey No. 261, pp. 18-23.

[2] For description of this station, which is located at a dam, and the methods of computing discharge, see page 33.

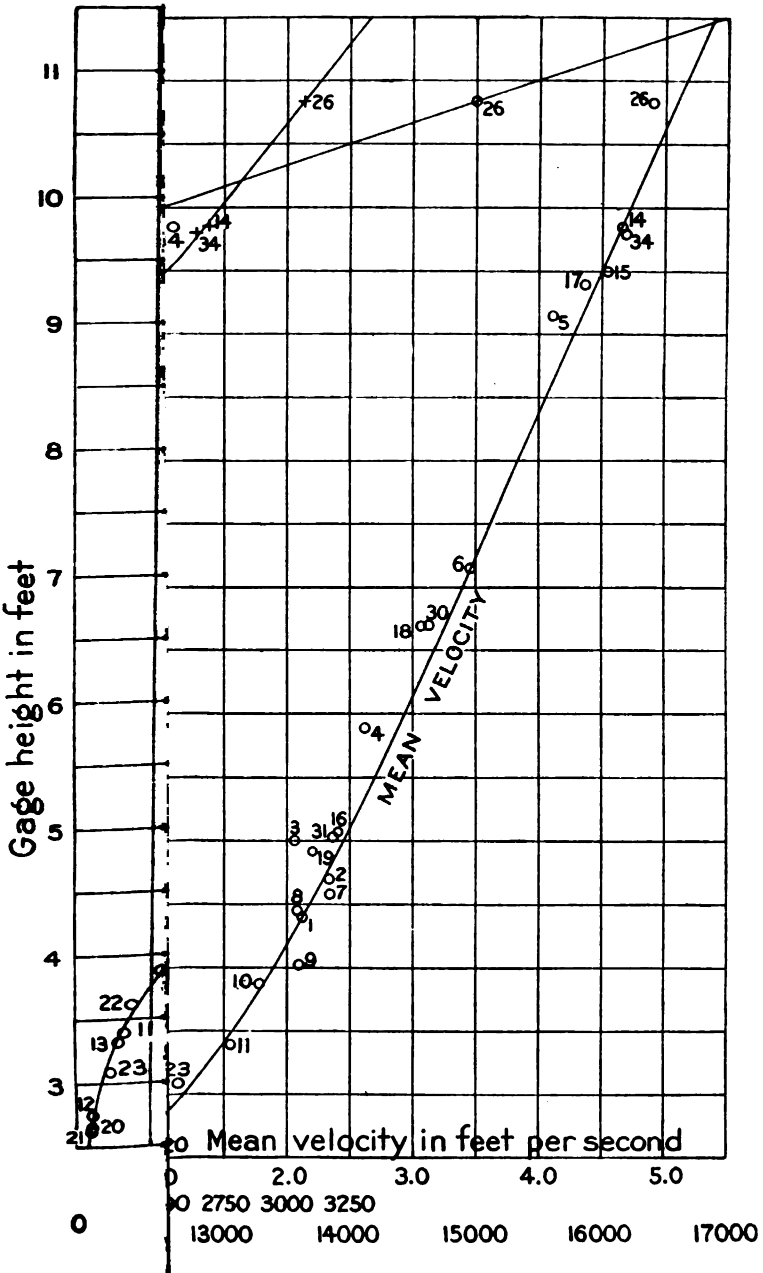
The two classes of methods of measuring velocity with current meters in most general use are the multiple point and single point. The two principal multiple-point methods in general use are the vertical velocity curve and 0.2 and 0.8 depth.

In the vertical velocity curve method a series of velocity determinations are made in each vertical at regular intervals, usually about 10 to 20 per cent of the depth apart. These velocities are plotted as abscissas and their depths as ordinates and a smooth curve is drawn among resulting points. The mean velocity in the vertical is then obtained by dividing the area bounded by this velocity curve and its axis by the depth. This method of obtaining the mean velocity in the vertical is probably best known, but on account of the length of time required to make a complete measurement its use is largely limited to the determination of coefficients for purposes of comparison and to measurements under ice.

In the second multiple-point method the meter is held successively at 0.2 and 0.8 depth, and the mean of the velocities at these two points is taken as the mean velocity for that vertical. Observations under a wide range of conditions show that this multiple-point method gives the mean velocity very closely for open-water flow, and that in a completed measurement it seldom varies as much as 1 per cent from the value given by the vertical velocity-curve method. Moreover, experience indicates that it holds nearly as well for ice-covered rivers. During the last two or three years it has been extensively used in the regular practice of the United States Geological Survey.

In the single-point method the meter is held either at the depth of the thread of mean velocity or at an arbitrary depth for which the coefficient for reducing to mean velocity has been determined or must be assumed. In general practice the thread of mean velocity has been found to be located at about 0.6 depth, and almost all measurements made prior to 1907 were made by this method.

In the other principal single-point method the meter is held near the surface, usually 1 foot below, or low enough to be out of the effect of the wind or other disturbing influence. This is known as the subsurface method. The coefficient for reducing the velocity taken at the subsurface to the mean has been found in general to be from about 0.85 to 0.95, depending on the stage, the velocity, and the condition


Gage height in feet
11
10
9
8
7
6
5
4
3
0
Mean velocity in feet per second
0
2.0
3.0
4.0
5.0
2750 3000 3250
13000
14000
15000
16000
17000
MEAN VELOCITY
26
14
34
15
17
5
6
30
18
4
16
31
3
19
2
7
8
1
9
10
11
22
13
23
12
20
21

KEAG.

of the channel. This method is especially adapted for measurements during floods or when the velocity is so great that the meter can not be kept in the correct position for the other methods.

The determination of the flow of an ice-covered stream is difficult, owing to diversity and instability of conditions during the winter period and also to lack of definite information in regard to the laws of flow of water under ice. The method now employed is to make frequent discharge measurements by the 0.2 and 0.8 and the vertical velocity curve methods during the ice periods, and to keep record accurately of the gage height to the surface of the water as it rises in a hole cut in the ice and the thickness and character of the ice. From these data the daily flow can be estimated approximately by constructing a rating curve (really a series of curves) similar to that used for flow in open channels, but considering, in addition to gauge heights and discharge, the varying thickness of ice.[1]

OFFICE METHODS OF COMPUTING AND STUDYING DISCHARGE AND RUN-OFF.

The discharge measurements are plotted on cross-section paper and rating curves are drawn. (See Pl. IV.) The rating tables prepared from these curves are then applied to the tables of daily gage heights to obtain the daily discharges, and from these applications the tables of monthly discharge and run-off are computed.

The stations in the Penobscot River basin present the most favorable conditions for accurate determinations of discharge. The stream bed is, as a rule, composed of rock, and is not subject to change by deposits of sediment and loose material. Discharge measurements made at these stations usually plot within 2 or 3 per cent or less of the mean discharge curve, and the rating tables developed from the curves represent a high degree of accuracy.

Estimates have been made of the monthly discharge during winter months for 1907, 1908, and 1909. These estimates are based on available measurements under ice conditions, on daily records of temperature and precipitation obtained from the climate and crop reports of the United States Weather Bureau, on observers' notes, and on a careful and thorough intercomparison of results with those obtained on adjacent streams. Although every care possible is used in making these estimates, many of them are very rough, the data for some of them being so poor that the estimates are liable to as much as 50 per cent error. It is believed, however, that estimates of this character are better than none at all, and that they indicate in a relative way the proportionate amount of flow during the frozen period. These estimates are included in the annual discharge. The large error of the individual months has a relatively small effect on the annual total, and it is for many purposes desirable to have the yearly discharge computed, even though it involves some error.

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[1] For information in regard to flow of streams under ice see Water-Supply Paper U. S. Geol. Survey No. 187.

ACCURACY AND RELIABILITY OF FIELD DATA AND COMPARATIVE RESULTS.

Practically all current-meter measurements made under fair conditions are well within 5 per cent of the true discharge at the time of observation. Inasmuch as the errors of meter measurements are largely compensating, the mean rating curve, when well defined, is much more accurate than the individual measurements. Numerous experiments made especially to test the accuracy of current-meter work show that it compares very favorably with the results from standard weirs, and, owing to simplicity of methods, usually gives results that are much more reliable than those from stations at dams, where uncertainty regarding the coefficient and complicated conditions of flow prevail.

The work is, of course, dependent on the reliability of the observers. With relatively few exceptions, the observers perform their work honestly. Care is taken, however, to watch them closely and to inquire into any discrepancies. It is, of course, obvious that one gage reading a day does not always give the mean height for that day. As an almost invariable rule, however, errors from this source are compensating and virtually negligible in a period of one month, although a single day's reading may, when taken by itself, be considerably in error.

In order to give engineers and others information regarding the probable accuracy of the computed results, footnotes are added to the rating tables and an accuracy column is inserted in the monthly-discharge table. In the rating tables "well defined" indicates that the rating is probably accurate within 5 per cent; "fairly well defined," within 10 per cent; "poorly defined" or "approximate," within 15 to 25 per cent. These notes are very general and are based on the plotting of the individual measurements with reference to the mean rating curve.

The accuracy column in the monthly-discharge table does not apply to the maximum or minimum, nor to any individual day, but to the monthly mean. It is based on the accuracy of the rating, the probable reliability of the observer, and knowledge of local conditions. In this column, A indicates that the mean monthly flow is probably accurate within 5 per cent; B, within 10 per cent; C, within 15 per cent; D, within 25 per cent. Special conditions are covered by footnotes.

USE OF THE DATA.

In general, the policy is followed of making available for the public the base data which are collected in the field each year by the survey engineers. This is done not only to comply with the law, but also for the express purpose of giving to any engineer the opportunity of examining the computed results and of changing and adjusting them as may seem best to him. Although it is believed that the rating tables and revised monthly discharges are as good as the base data up to and including the current year will warrant, it should be borne in mind that additional data collected at these stations from year to year in the future will throw new light on data already collected and published, and hence allow more or less improvement in the computed results of earlier years.

The values in the table of monthly discharge are so arranged as to give only a general idea of the conditions of flow at the station, and it is not expected that they will be used for other than preliminary estimates. This is particularly true of the maximum and minimum figures, which, owing to the method of collecting these data, are liable to large errors. The maximum value should be increased considerably for many stations in considering designs for spillways, and the minimum value should be considered for a group of, say, seven days and not for one day.

The rating table is published primarily to allow the engineer to apply it directly to the daily gage heights and rearrange the daily discharges in order of magnitude or by some other method.

EXPLANATION OF TABLES.

For the Penobscot River drainage basin there is given a brief general description covering such subjects as area, source, tributaries, topography, geology, forests, rainfall, ice conditions, storage, power sites, and other special features of importance or interest.

For each regular current-meter gaging station are given the following data: Description of station, list of discharge measurements, table of daily gage heights, rating table, table of daily discharges, and table of monthly and yearly discharges and run-off. For the Millinocket station, the gage heights and rating tables are omitted and a table of daily discharge is substituted.

In addition to statements regarding the location and installation of current-meter stations, the descriptions give information in regard to any conditions which may affect the constancy of the relation between gage height and discharge, covering such points as ice, logging, and backwater. Statements are also made regarding the accuracy and reliability of the data.

The discharge-measurement table gives the results of the discharge measurements made during the year, including the date, gage height, and discharge in second-feet.

The table of daily gage heights gives the daily fluctuations of the surface of the river as found from the mean of the gage readings taken each day. The gage height given in the table represents the elevation of the surface of the water above the zero of the gage. All gage heights during ice periods, backwater from obstructions, etc., are published as recorded, with suitable footnotes. The rating is not applicable for such periods unless the proper correction to the gage heights is known and applied.

The discharge measurements and gage heights are the base data from which the rating tables and monthly discharge tables are computed.

The rating table gives, either directly or by interpolation, the discharge in second-feet corresponding to every stage of the river recorded during the period for which it is applicable. It is published to enable engineers to determine the daily discharge by its application to the table of gage heights or to check results in the table of monthly discharge.

In the table of monthly discharge the column headed "Maximum" gives the mean flow, as determined from the rating table, for the day when the mean gage height was highest. As the gage height is the mean for the day, it does not indicate correctly the period when the water surface was at crest height and the corresponding discharge consequently larger than given in this column. Likewise, in the column headed "Minimum" the quantity given is the mean flow for the day when the mean gage height was lowest. The column headed "Mean" is the average flow in cubic feet for each second during the month. On this the computations for the remaining columns, which are defined on pages 32–33, are based.

DEFINITION OF TERMS.

The volume of water flowing in a stream—the "run-off" or "discharge"—is expressed in various terms, each of which has become associated with a certain class of work. These terms may be divided into two groups: (1) Those which represent a rate of flow, as second-feet, and run-off in second-feet per square mile, and (2) those which represent the actual quantity of water, as run-off in depth in inches. They may be defined as follows:

"Second-foot" is an abbreviation for cubic foot per second and is the rate of discharge of water flowing in a stream 1 foot wide, 1 foot deep, at a rate of 1 foot per second.

"Second-feet per square mile" is the average number of cubic feet of water flowing per second from each square mile of area drained, on the assumption that the run-off is distributed uniformly both as regards time and area.

"Run-off in inches" is the depth to which the drainage area would be covered if all the water flowing from it in a given period were conserved and uniformly distributed on the surface. It is used for comparing run-off with rainfall, which is usually expressed in depth in inches.

LOCATION OF STATIONS.

The location of the various gaging stations for which data regarding flow are here given is indicated on Plate I by letters, and in the following table:

Gaging stations in Penobscot basin.

Letter on Plate I.	River.	Location.	Date established.	Established by—
A	West Branch of Penobscot.	Millinocket	Jan. 11, 1901	Great Northern Paper Co. furnish records.
B	Penobscot	West Enfield	Nov. 5, 1901	U. S. Geol. Survey.
C	East Branch of Penobscot.	Grindstone	Oct. 23, 1902	Do.
D	Mattawamkeag	Mattawamkeag	Aug. 26, 1902	Do.
E	Piscataquis	Near Foxcroft	Aug. 17, 1902	Do.
F	Cold Stream	Enfield	June 14, 1904	U. S. Geol. Survey. Discontinued Dec. 31, 1906.
G	Kenduskeag	Near Bangor	Sept. 15, 1908	U. S. Geol. Survey.
H	Phillips Lake, north outlet.	East Holden	July 7, 1904	U. S. Geol. Survey. Discontinued July 1, 1908.
H	Phillips Lake, southeast outlet.[a]	Near Lake House	July 19, 1904	Do.
H	Phillips Lake	Near East Holden	.....do	Do.

[a] Read only at times of visits of the hydrographers.

WEST BRANCH OF PENOBSCOT RIVER AT MILLINOCKET.

The discharge of Penobscot River at the Millinocket mill of the Great Northern Paper Co. has been computed and the data have been furnished since 1901 by H. S. Ferguson, engineer for the company. The Millinocket site was developed by placing a concrete dam on the Penobscot at the outlet of Quakish Lake (see Pl. V), a little over a mile from the mill site on Millinocket Stream, which enters the Penobscot about 4½ miles below Quakish Lake. Millinocket Stream has only a slight fall but the main river drops some 112 feet in this vicinity, and by utilizing the stream for a tailrace a head of about 110 feet has been obtained.

About 3 miles above Quakish Lake dam is the comparatively new North Twin Lake storage dam, affording about 14.5 billion cubic feet of storage. Quakish Lake dam is at an elevation of 456.3 feet above sea level, as determined by the Penobscot River survey of 1904.

Records are obtained by considering the flow through the wheels, the flow over the Quakish Lake dam, and water used from time to time by the log sluice, filters, etc. The wheels were rated at Holyoke, Mass., before being placed in position. As the head under which they work, averaging about 110 feet, is much greater than the head under which they were tested, numerous tube-float measurements of flow in the canal leading to the mill have been made by Mr. Ferguson in order to determine just how much water the mill used under different gate openings. In addition to this, during 1904 a series of current-meter measurements were made by the United States Geological Survey to check results obtained by the floats and to obtain a suitable coefficient for use with the float measurements. It is believed that these various checks on the measurements insure a good estimate of the flow through the wheels.

An automatic recording gage of the Friez type is installed at Quakish Lake dam and flow is computed by the formula $Q=cbh^{\frac{3}{2}}$ in which c is a variable coefficient obtained (1) from the results of weir measurements made by Mr. Ferguson on a 10-foot portion of the dam, and (2) from a study of the results of experiments made by George W. Rafter at the Cornell testing flume.

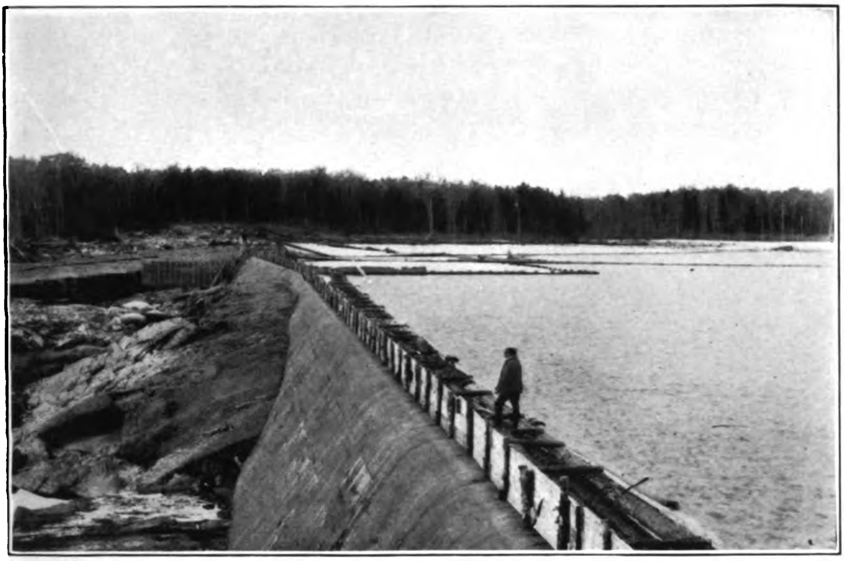
When the flow of the river is less than 2,500 second-feet all the water is generally used through the mill; flow over the flashboards, which are used much of the time, is computed by use of the formula $Q=3.33bh^{\frac{3}{2}}$.

Several storage dams, including the North Twin dam previously mentioned, which have been constructed at points in the basin above this mill, store water on a surface of about 65 square miles, with a capacity of about 30 billion cubic feet. Except during the time (usually in August) that excess water has to be applied for log driving on the river below Millinocket and for a short time in the spring the run-off is regulated by storage. Further storage sufficient to practically control the run-off from the drained area above Millinocket is contemplated by the Great Northern Paper Co. Millinocket Lake is now being used for power storage at the new mills of the company at East Millinocket and Dolby. It has been utilized for log driving for many years.

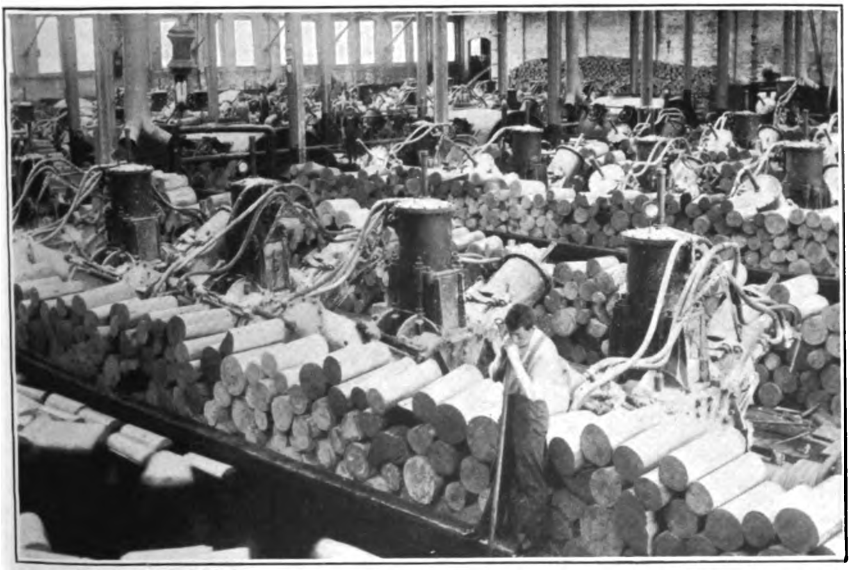
The records of the discharge at Millinocket are under the personal supervision of Mr. Ferguson, are carefully kept, and are rated as excellent. No difficulty is experienced in winter on account of ice affecting the estimates of discharge or the running of the wheels. Ferguson Pond, just above the entrance to the canal, eliminates effect from anchor ice.

The maximum daily discharge—24,250 second-feet—since the beginning of the records occurred April 1 and 2, 1903; the minimum weekly discharge, not considering periods when water was not in use at the mill, was 291 second-feet from January 28 to February 3, 1904.

The Millinocket mill of the Great Northern Paper Co., with nearly 25,000 horsepower of wheel installation, has a daily output of about 300 tons of pulp and 300 tons of paper, and is doubtless the largest mill in the world. At East Millinocket and Dolby, about 10 miles



A. QUAKISH LAKE DAM OF GREAT NORTHERN PAPER CO., NEAR MILLINOCKET.



B. GRINDER ROOM IN MILLINOCKET MILL OF GREAT NORTHERN PAPER CO.

down river, are other mills of this company, constructed during 1907. utilizing over 15,000 horsepower of wheels, with a daily capacity of about 180 tons of pulp and 130 tons of paper.

Daily discharge, in second-feet, of West Branch of Penobscot River at Millinocket, 1901–1909.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1901.												
1	....	1,580	1,740	1,710	20,220	2,580	2,580	1,800	[a]2,310	2,000	760	[a]410
2	....	1,670	1,510	1,370	19,360	[a]2,680	2,490	1,980	3,600	1,960	690	470
3	....	[a]2,250	[a]1,450	1,680	18,030	2,760	2,680	1,690	3,280	1,960	[a]570	470
4	....	1,410	1,680	2,000	17,240	2,440	3,310	[a]2,830	2,130	1,950	710	460
5	....	1,840	1,930	1,920	[a]16,280	2,550	1,540	1,760	1,940	1,540	760	450
6	....	1,630	1,510	2,180	15,030	2,430	1,930	2,000	1,930	[a]1,740	700	440
7	....	1,210	1,410	[a]2,800	14,000	2,550	[a]2,420	1,910	1,810	1,990	510	430
8	....	1,660	1,300	3,210	9,240	2,680	2,710	2,850	[a]3,750	1,940	490	[a]420
9	....	1,910	1,160	4,890	6,130	[a]2,540	2,390	3,960	3,110	1,960	330	860
10	....	[a]1,480	[a]1,470	4,420	5,280	2,770	2,600	3,930	1,940	1,950	[a]1,090	840
11	1,310	1,050	1,930	5,430	3,410	2,770	2,450	[a]6,500	1,880	1,600	1,020	850
12	960	1,740	1,510	6,030	[a]2,740	2,480	2,630	6,440	1,970	1,240	760	450
13	[a]1,200	2,360	1,510	5,920	2,790	2,780	3,450	2,030	1,940	[a]980	630	450
14	1,500	1,890	1,720	[a]6,400	2,930	2,960	[a]2,830	1,940	1.820	1,530	1,230	470
15	1,460	1,860	1,510	8,610	3,130	3,200	6,790	2,060	[a]8,860	1,320	760	[a]780
16	1,310	2,000	2,030	8,880	3,320	[a]3,370	3,820	2,200	3,880	1,250	750	1,760
17	1,260	[a]1,230	[a]1,450	9,860	4,130	3,370	4,010	1,980	1,950	1,130	[a]380	1,520
18	1,430	1,650	1,610	12,390	3,830	2,350	3,520	[a]2,910	3,010	1,470	790	1,530
19	1,450	1,440	1,770	12,320	[a]4,650	2,240	7,600	2,160	3,980	1,650	720	1,890
20	[a]1,390	1,550	1,830	14,020	4,750	2,450	8,140	2,040	3,360	[a]1,420	440	1,720
21	1,500	1,390	1,410	[a]15,770	3,250	2,390	[a]3,850	2,040	3,150	1,020	450	1,800
22	1,780	1,760	1,370	17,230	2,260	2,360	6,880	1,990	[a]4,470	990	450	[a]1,880
23	1,000	1,450	1,420	19,210	2,010	[a]2,570	3,310	1,970	4,050	1,120	360	1,710
24	1,700	[a]1,600	[a]1,480	11,360	1,520	2,400	2,270	1,980	1,930	790	[a]390	1,710
25	1,410	1,640	1,780	10,410	1,780	2,800	2,380	[a]2,020	1,910	1,060	400	990
26	2,060	1,330	1,910	10,650	[a]1,890	2,710	2,120	4,880	1,920	1,010	450	1,900
27	[a]1,560	1,420	1,510	20,040	3,440	2,560	2,860	2,700	1,960	[a]610	860	1,810
28	1,590	1,600	1,940	[a]22,110	2,690	2,280	[a]2,260	1,910	1,830	840	980	1,700
29	1,390	....	1,940	20,360	2,980	2,760	6,250	1,950	[a]1,360	730	450	[a]1,760
30	1,170	....	1,990	20,240	2,570	[a]2,860	6,250	1,790	1,960	750	810	2,000
31	1,600	....	[a]1,350	....	3,050	....	3,240	1,910	....	780	....	1,960
1902.												
1	2,230	1,930	2,140	13,150	11,180	[a]4,130	3,040	2,520	2,300	2,140	2,240	5,140
2	2,860	[a]2,630	[a]2,110	14,110	11,180	2,890	2,820	2,520	2,640	2,030	[a]2,090	2,620
3	2,160	2,180	2,110	13,820	11,190	5,430	2,580	[a]1,570	2,160	2,070	4,860	2,360
4	2,160	2,090	2,110	13,380	[a]11,070	6,300	460	2,540	2,540	2,090	2,410	2,370
5	[a]2,130	2,110	2,110	14,050	11,420	11,600	330	2,440	2,190	[a]2,330	2,410	2,390
6	2,010	2,040	2,100	[a]14,050	12,600	11,600	[a]1,420	2,540	2,150	2,540	2,530	2,130
7	2,040	2,100	2,180	15,030	12,580	12,440	2,560	2,560	[a]1,790	2,410	2,580	[a]2,010
8	2,010	1,940	2,340	14,120	15,030	[a]17,240	2,570	2,510	2,420	2,200	2,220	5,390
9	2,020	[a]3,440	[a]2,350	13,240	13,380	20,040	2,570	2,980	2,180	2,250	[a]2,220	2,950
10	1,950	2,120	2,530	13,180	12,960	19,370	2,560	[a]2,820	2,420	2,290	2,510	2,570
11	1,740	2,020	2,320	13,170	[a]14,840	20,590	2,560	2,250	2,380	2,140	2,470	2,400
12	[a]2,030	2,000	2,820	13,070	12,140	20,230	2,560	2,450	2,170	[a]1,940	2.480	2,440
13	2,030	2,060	2,820	[a]13,340	12,150	17,510	[a]2,380	2,430	2,070	2,110	2,090	2,340
14	2,030	1,970	2,700	13,210	10,470	15,590	2,550	2,410	[a]1,780	2,450	2.520	[a]2,420
15	2,020	1,870	2,690	12,310	16,920	[a]11,860	2,570	2,500	2,100	2,150	2,440	4,390
16	2,190	[a]3,090	[a]2,500	12,400	6,350	11,600	2,550	2,430	2,110	2,770	[a]2,540	2,530
17	2,030	3,370	5,500	12,390	6,220	10,870	2,560	[a]2,010	2,520	2,420	2,650	2,510
18	1,910	2,060	5,390	12,010	[a]9,590	10,980	2,500	2,220	2,110	2,640	2,570	2,480
19	[a]2,560	2,110	6,430	6,770	9,050	7,710	2,540	2,260	2,070	[a]2,330	2,500	2,600
20	1,980	2,120	6,960	[a]8,380	7,680	9,560	[a]2,290	4,380	2,060	2,460	2,540	2,520
21	1,950	2,130	8,760	9,030	5,880	3,210	2,550	4,330	[a]1,910	2,180	2,410	[a]2,190
22	1,970	2,020	8,580	7,840	8,820	[a]3,930	2,550	4,310	2,120	2,490	2,390	3,970
23	2,070	[a]3,440	[a]8,190	7,940	8,920	3,930	2.550	3,870	2,080	2,170	[a]1,350	2,440
24	1,960	2,110	9,950	7,950	8,800	3,570	2,560	[a]1,890	2,120	2,160	2,700	1,960
25	2,080	2,120	9,910	9,740	[a]6,220	3,290	2,550	2,480	2,130	2,170	2,440	570
26	[a]2,660	2,130	9,790	10,180	5,940	3,290	2,530	2,280	2,140	[a]1,960	2,450	3,490
27	1,950	2,140	9,820	[a]11,330	8,260	3,270	[a]2,370	2,460	2,110	2,150	2,440	2,470
28	1,800	2,120	9,790	11,740	3,090	3,900	2,560	2,410	[a]1,870	2,570	2,500	[a]2,230
29	3,270	....	9,840	11,190	3,120	[a]2,970	2,800	2,330	2,090	2,590	2,410	2,200
30	2,170	....	[a]9,970	11,200	3,110	2,870	2,590	2,450	2,480	2,160	[a]1,440	2,150
31	2,160	....	9,970	....	3,110	....	2,700	[a]1,930	....	2,520	....	2,160

[a] Sunday.

Daily discharge, in second-feet, of West Branch of Penobscot River at Millinocket, 1901-1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.[a]												
1....	1,740	[b]1,210	[b]890	24,250	10,340	1,680	2,670	2,330	2,500	1,380	[b]50	50
2....	1,750	1,140	1,130	24,250	11,060	2,290	2,540	[b]5,800	3,060	1,410	510	50
3....	1,740	2,280	2,040	22,550	[b]10,610	2,160	2,440	1,410	3,340	1,350	510	50
4....	[b]740	2,310	1,810	20,930	11,670	2,510	1,570	2,520	2,430	[b]830	520	50
5....	1,240	2,020	1,960	[b]20,470	12,290	2,440	[b]1,020	2,550	2,480	1,190	510	50
6....	1,780	2,120	2,160	19,630	10,330	2,370	1,910	2,520	[b]1,500	400	520	[b]50
7....	1,720	2,220	2,130	21,710	9,790	[b]1,230	2,380	2,350	410	990	580	50
8....	1,690	[b]1,460	[a]750	17,850	9,290	1,220	2,160	2,460	1,120	990	[b]240	230
9....	1,770	1,130	1,210	12,590	10,400	2,350	3,190	[b]6,550	2,330	980	530	550
10....	1,820	2,140	1,790	10,960	[b]10,650	2,350	3,260	1,340	2,390	990	510	650
11....	[b]810	2,220	1,690	9,730	9,860	2,420	2,490	6,750	2,450	[b]400	550	840
12....	1,190	2,240	1,680	[b]10,130	10,360	2,460	[b]2,210	2,560	2,260	970	540	570
13....	1,990	2,200	1,900	9,120	9,390	2,510	1,360	2,550	[b]1,970	960	680	[b]360
14....	1,690	2,210	4,400	9,760	6,930	[b]1,280	3,340	5,050	1,790	950	550	540
15....	1,660	[b]1,070	[b]1,830	9,800	5,940	1,610	2,450	5,430	2,460	860	[b]50	560
16....	1,720	1,100	1,440	9,680	5,940	2,450	2,540	[b]4,430	1,840	900	580	750
17....	1,720	2,160	2,780	9,760	[b]8,310	2,410	2,480	4,800	2,310	750	960	670
18....	[b]790	2,180	2,210	9,700	4,970	2,520	2,540	6,100	2,120	[b]460	570	530
19....	1,050	2,080	2,490	[b]9,470	5,370	2,550	[b]2,290	5,500	2,200	720	750	570
20....	2,050	2,120	2,890	9,600	2,430	2,560	2,360	5,910	[b]1,410	730	730	[b]550
21....	2,070	2,190	2,960	10,920	2,430	[b]1,900	1,400	3,780	1,240	740	570	560
22....	1,980	[b]1,000	[b]5,680	10,900	2,280	750	2,500	2,240	2,430	730	[b]50	890
23....	1,720	1,190	4,460	10,870	2,410	2,610	2,550	[b]1,300	2,090	630	50	960
24....	1,640	2,140	6,150	10,820	[b]1,670	2,540	2,550	1,830	1,790	640	50	510
25....	[b]460	1,900	10,390	10,520	1,520	2,470	2,500	2,470	1,750	[b]230	50	50
26....	1,220	1,940	14,960	[b]9,100	2,410	2,530	[b]5,170	2,650	1,780	630	50	50
27....	2,220	1,850	17,030	12,340	2,360	2,420	2,000	2,720	[b]690	600	60	[b]400
28....	2,160	2,170	17,810	10,780	2,470	[b]1,220	2,460	2,610	760	570	180	430
29....	2,330	....	[b]19,580	11,030	2,390	1,290	2,580	2,380	1,160	490	[b]50	600
30....	2,330	....	19,790	10,340	2,480	2,400	2,410	[b]1,720	1,390	510	50	570
31....	1,610	....	20,960	....	[b]1,610	....	1,990	660	....	520	....	560
1904.												
1....	237	413	403	315	[b](2,036)	4,705	4,088	2,366	2,027	3,005	2,255	(2,136)
2....	141	360	407	284	2,266	4,566	4,894	4.977	2,389	(2,596)	2,261	2,261
3....	[b]159	410	416	[b]560	2,294	4,247	[b]4,490	4,988	2,020	2,186	2,251	2,292
4....	417	401	389	338	2,150	4,151	4,520	4,982	[b]2,653	(2,242)	2,326	[b]2,204
5....	405	409	414	221	2,297	[b]4,844	4,247	4,958	2,420	2,298	2,336	2,285
6....	421	403	[b]109	582	2,332	4,746	4,309	2,424	2,014	2,026	[b]2,298	2,250
7....	436	[b]200	368	1,013	2,326	5,345	4,330	[b]2,077	2,018	2,313	2,271	2,002
8....	392	436	404	681	[b]2,116	4,900	2,448	2,308	2,026	2,363	2,347	2,359
9....	398	415	392	702	(2,176)	4,353	[b]4,535	4,913	1,996	[b]2,350	2,367	2.366
10....	[b]385	448	397	[b]436	2,235	4,353	2,031	4,936	2,024	2,437	2,331	(2,338)
11....	430	423	391	639	2,306	4,209	3,386	4,936	[b]2,390	2,077	2,318	[b](2,310)
12....	393	438	492	1,019	2,332	[b]4.197	3,076	4,939	2,331	2,062	2,355	(2,283)
13....	345	430	[b]467	995	2,315	4,730	3,068	4,924	2,041	2,341	[b]2,394	(2,256)
14....	244	[b]198	737	1,087	2,384	3,848	2,219	[b]4,659	2,400	2,048	2,310	(2,228)
15....	362	411	724	973	[b]5,100	3,193	2,010	4,789	2,019	2,005	(2,307)	(2,200)
16....	438	433	828	859	5,010	2,433	2,007	4,937	2,023	[b]2,311	(2,305)	2,000
17....	[b]216	434	799	[b]1,095	10.255	2,415	[b]3,093	4,959	(2,092)	2,015	(2,302)	2,250
18....	376	434	421	1,056	11,314	2,417	2,031	4,921	[b]2,162	2,026	(2,300)	[b]2,005
19....	332	433	793	1,094	11,682	[b]2,277	2,392	2,347	2,339	2,423	(2,297)	2,010
20....	205	403	[b]488	1,112	11,673	2,418	2,906	2,014	2,025	2,042	(2,295)	(2,009)
21....	428	[b]188	788	1,108	10,671	2,434	4,097	[b]2,027	2,018	2,059	2,293	(2,008)
22....	414	200	814	1,473	[b]7,043	2,454	2,420	2,178	2,327	2,049	2,291	(2,005)
23....	297	200	462	1,457	7,324	2,433	2,037	2,008	(2,289)	[b]2,015	2.289	(2.004)
24....	[b]149	275	470	[b]1,072	9,276	2,424	[b]3,658	2,378	(2,250)	2,310	2,255	2.003
25....	450	426	453	1,473	8,645	3,125	2,005	2,017	[b]2,212	2,403	(2,355)	[b]2,000
26....	416	415	818	1,463	5,266	[b]5,028	2,019	2,002	2,005	2,055	(2,455)	22,549
27....	431	404	[b]615	1,469	4,737	4,757	3,663	2,000	2,002	2,067	[b]2,555	2,003
28....	214	[b]189	623	1,807	3,710	4,171	(3,676)	[b]2,312	2,023	2,077	2,302	2,012
29....	238	368	408	1,802	[b]3,831	3,106	(3,690)	2,022	2,003	2,027	2,003	(2,150)
30....	249	....	444	1,805	5,142	2,488	3,703	2,035	2,010	(2,103)	2,010	2,287
31....	[b]150	....	420	....	5,448	....	[b]2,005	2,119	....	(2,179)	....	2,002

[a] Mill shut down Nov. 1, 5, and 22 to Dec. 6, inclusive, and Dec. 25 and 26, 1903.
[b] Sunday.

NOTE.—Values in parentheses interpolated.

Daily discharge, in second-feet, of West Branch of Penobscot River at Millinocket, 1901–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1	[a]2,235	2,122	2,577	1,299	2,504	8,906	2,063	4,712	2,395	[a]2,235	428	452
2	2,396	2,132	2,108	[a]1,018	2,548	7,372	[a]3,922	4,817	2,392	2,510	453	451
3	2,143	2,137	2,119	1,278	2,521	2,553	2,627	4,971	[a]2,300	2,505	437	[a]332
4	2,125	1,970	2,181	1,287	2,519	[a]2,448	2,300	4,981	2,207	2,420	437	452
5	2,145	[a]2,355	[a]2,266	1,282	2,532	2,088	2,738	4,607	2,200	1,993	[a]348	453
6	2,161	2,142	2,190	1,685	2,536	2,109	2,677	[a]4,077	2,352	2,080	439	448
7	2,163	2,150	2,129	2,106	[a]2,329	2,094	2,046	4,294	2,356	2,088	437	457
8	[a]2,186	2,151	2,020	2,119	2,523	2,110	2,044	4,766	2,381	[a]1,965	438	456
9	2,165	2,151	1,965	[a]2,152	2,529	2,105	[a]2,054	5,297	2,086	2,081	444	445
10	2,174	2,063	1,972	2,138	2,524	2,093	2,058	4,393	[a]2,063	2,091	440	[a]315
11	2,595	2,524	1,967	2,426	2,527	[a]2,463	3,599	2,232	2,068	2,095	456	435
12	2,155	[a]2,465	[a]1,883	2,544	6,185	2,416	2,063	2,028	2,075	2,090	[a]359	408
13	2,145	2,158	1,968	2,545	6,658	2,094	2,066	[a]2,111	2,072	2,098	470	440
14	2,140	2,169	1,960	2,540	[a]5,646	2,524	2,061	2,234	2,068	2,090	465	444
15	[a]2,254	2,160	1,198	2,542	7,187	2,111	2,061	2,074	2,070	[a]1,970	455	436
16	2,318	2,174	2,201	[a]2,625	7,186	2,104	[a]2,855	2,358	2,072	2,070	462	427
17	2,113	2,157	2,039	2,575	7,107	2,085	2,322	3,285	[a]1,944	1,661	424	[a]303
18	2,165	2,032	1,728	2,528	7,660	[a]2,367	2,045	3,159	2,415	1,656	450	425
19	2,165	[a]2,232	[a]1,126	2,535	8,492	2,092	2,035	3,170	2,420	1,663	[a]343	431
20	2,191	2,143	1,368	2,516	8,378	2,088	2,015	[a]2,595	2,090	1,411	470	432
21	2,169	2,163	1,266	2,526	[a]8,844	2,058	2,058	2,253	2,500	716	453	432
22	[a]2,463	2,169	1,279	2,482	8,181	2,066	2,048	2,051	2,488	[a]358	464	428
23	2,475	2,164	1,264	[a]2,376	7,619	2,078	[a]2,343	2,064	2,495	430	456	425
24	2,169	2,192	1,290	2,460	7,800	2,477	2,348	2,048	[a]2,505	421	443	[a]173
25	2,141	2,163	1,787	2,530	8,006	[a]2,477	2,084	2,037	2,510	422	445	140
26	2,137	[a]2,273	[a]1,038	2,521	9,078	2,070	2,068	2,050	2,508	429	[a]364	428
27	2,545	2,191	1,305	2,516	8,862	3,570	2,053	[a]2,042	2,522	430	424	438
28	2,066	2,164	1,296	2,509	[a]9,435	1,973	2,038	2,180	2,520	441	356	444
29	[a]2,165	....	1,308	2,527	9,330	2,476	2,057	2,034	2,522	[a]355	448	444
30	2,425	....	1,280	[a]2,429	9,171	2,491	[a]3,283	2,036	2,510	435	441	449
31	2,133	....	1,299	....	9,059	....	4,184	2,227	....	438	....	[a]444
1906.												
1	342	992	656	[a]548	2,541	5,071	[a]7,619	5,830	2,042	2,054	2,075	2,041
2	363	833	643	634	2,511	5,061	7,708	6,329	[a](2,020)	2,041	2,071	[a](2,044)
3	351	943	674	636	2,511	[a]4,836	2,431	4,015	1,999	2,043	2,059	[a](2,048)
4	364	[a]480	[a]571	636	2,511	4,579	3,554	3,641	[a](1,996)	2,039	[a](2,034)	2,051
5	349	998	791	616	2,508	4,236	4,062	[a]3,699	1,994	2,042	2,009	2,044
6	368	918	782	637	[a](2,495)	6,047	2,752	3,983	1,983	2,028	2,055	2,043
7	[a]195	843	784	628	2,482	2,944	2,531	4,015	1,984	[a](2,006)	2,025	2,027
8	349	607	821	[a]556	2,493	2,911	[a]5,155	4,104	2,035	1,983	2,082	2,044
9	343	686	785	644	2,493	3,328	4,882	4,614	[a](2,037)	2,043	2,083	[a]1,988
10	355	835	776	624	2,702	[a]5,973	2,534	4,540	2,039	2,034	2,078	2,044
11	360	[a]554	[a]549	641	2,516	6,155	2,521	4,270	2,036	2,031	[a](2,068)	1,993
12	358	800	789	636	2,671	6,028	3,927	[a]4,027	2,034	[a](2,036)	2,057	2,019
13	355	802	792	640	[a]4,138	4,797	5,402	4,062	2,039	2,042	2,075	2,030
14	[a]259	763	704	637	5,422	2,753	4,588	3,334	2,055	[a](2,040)	2,074	2,025
15	374	634	551	[a]520	9,400	3,510	[a]2,893	2,575	2,032	2,038	2,075	2,022
16	373	645	795	1,122	15,769	6,551	2,479	2,575	[a]2,030	2,040	2,074	[a](2,027)
17	374	791	618	1,061	17,972	[a]3,667	2,504	2,575	2,041	2,030	2,062	2,032
18	363	[a]516	[a]634	1,030	18,635	3,737	2,502	2,575	2,039	2,045	[a](2,056)	2,032
19	357	811	802	1,198	18,110	4,781	2,492	[a]2,618	2,035	2,042	2,050	2,030
20	363	640	801	1,202	[a]15,819	4,573	2,494	2,575	2,044	2,034	2,054	2,033
21	[a]230	657	651	1,249	11,154	6,230	2,492	2,575	2,024	[a](2,034)	2,063	2,047
22	343	818	646	[a]1,055	4,068	6,694	[a]3,322	2,575	2,032	2,033	2,056	2,004
23	347	647	654	2,036	6,815	5,313	2,502	2,299	[a](2,030)	2,037	2,055	[a]2,024
24	350	825	653	2,044	11,800	[a]3,495	2,421	2,030	2,029	2,032	2,056	2,030
25	352	[a]483	[a]557	2,372	9,376	6,062	2,493	2,043	2,031	2,038	[a](2,052)	2,035
26	360	795	652	2,494	6,655	6,380	2,513	[a]2,039	2,052	2,039	(2,049)	2,040
27	356	790	636	2,490	[a]5,505	6,314	2,690	2,035	2,040	2,045	(2,046)	2,045
28	[a]256	786	637	2,502	5,885	4,250	4,188	2,037	2,045	[a]2,055	2,043	2,051
29	726	....	635	[a](2,499)	5,379	5,428	[a]3,692	2,030	2,025	2,065	2,039	2,063
30	1,075	....	643	2,495	6,319	2,887	5,556	2,031	[a](2,040)	2,032	2,031	[a]2,055
31	1,195	....	635	....	5,098	....	5,578	2,028	....	2,032	....	2,057

[a] Sunday.

NOTE.—Values in parentheses interpolated.

Daily discharge, in second-feet, of West Branch of Penobscot River at Millinocket, 1901–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
1	2,067	2,018	849	324	2,507	13,220	6,923	2,900	[a]2,014	2,160	2,179	[a]7,940
2	2,064	2,033	812	451	2,519	[a]10,573	7,076	3,825	2,008	2,149	2,171	7,655
3	2,068	(a b)	[a]475	657	2,523	8,443	7,323	3,555	2,243	2,154	(a b)	6.300
4	2,068	2,000	804	644	2,740	7,787	6,102	(a b)	2,197	2,154	3,088	5.591
5	2,066	2,000	807	1,028	[a]3,486	7,616	6,146	4,300	2,198	2,164	2,880	4,669
6	(a b)	2,008	488	1,228	4,470	9,916	6,964	5,696	2,182	[a]2,001	3,370	3,450
7	2,075	2,005	328	[a]682	4,718	8,567	[a]6,425	5,476	2,181	2,011	2,917	2,690
8	2,066	2,014	328	1,124	4,713	7,763	6,264	5,143	[a]2,000	2,185	3,682	[a]2,600
9	2,070	2,006	326	1,241	5,110	[a]7,393	6,852	5,031	2,114	2,173	6,641	2,605
10	2,067	(a b)	[a]202	960	4,378	7,986	6,210	4,618	2,192	2,179	[a]7,318	3,406
11	2,055	2,007	337	824	4,685	6,077	4,868	[a]4,119	2,186	2,190	7,787	2,750
12	2,049	2,000	324	1,096	[a]4,459	5,705	2,853	3,914	2,180	2,185	8,671	4,927
13	(a b)	2,007	328	1,258	4,184	5,699	4,260	3,465	2,157	(a b)	8,454	4,824
14	2,002	1,741	333	[a]747	4,819	5,915	[a]6,408	3,060	2.182	2,000	8,434	2,850
15	2,000	1,235	320	1,497	5,563	6,131	6,401	3,015	[a]2,027	2,155	8,508	[a]3,350
16	2,000	1,252	333	1,674	7,727	[a]5,907	7,225	3,191	2,043	2,165	8,518	5,150
17	(b)	[a]1,008	[a]200	1,668	6,840	6,280	6,895	3,750	2,165	2,164	[a]8,373	5,000
18	(b)	1,241	337	1,659	7,778	6,173	6,756	[a]3,755	2,170	2,171	9,006	5,076
19	2,052	1,241	277	1,656	[a]7,732	6,273	5,674	3,389	2,165	2,175	9,066	5,076
20	(a b)	1,231	314	1,661	7,355	6,374	4,559	3,138	2,164	[a]3,061	9,057	5,024
21	2,000	1,244	325	[a]832	7,801	4,704	[a]4,936	3,225	2,165	7,726	9,057	5,020
22	2,000	1,252	321	1,847	7,376	5,607	4,521	3,205	[a]2,000	8,113	9,030	[a]4,950
23	2,000	1,255	316	2,420	7,528	[a]2,743	4,458	2,855	2,082	4,755	8,796	4,963
24	2,000	[a]753	[a]193	2,518	7,943	3,205	4,406	2,800	2,170	2,172	[a]8,886	4,934
25	2,000	968	317	2,523	8,486	6,861	4,607	[a]2,107	2,175	2,162	9,201	4,963
26	2,002	819	323	2,450	[a]12,208	6,815	3,939	3,233	2,259	2,174	[b]8,976	4,852
27	(a b)	825	318	2,435	14,255	6,955	2,575	2,610	2,222	(a b)	9,018	4,810
28	2,018	968	320	(a b)	12,952	6,943	[a]2,210	2,620	2,173	(b)	9,000	4,751
29	2,023	......	319	2,340	13,163	7,307	2,433	2,110	[a]2,000	2,218	8,415	[a]2,492
30	2,029	......	317	2,331	13,671	[a]6,824	2,575	2,110	2,105	2,537	8,068	2,616
31	2,019	......	[a]197	......	15,205	......	2,575	2,160	......	2,447	......	4,686
1908.												
1	3,570	3,115	[a]2,803	3,130	2,680	10,533	4,015	5,172	2,150	......	......	......
2	3,545	[a]1,650	3,049	3,105	2,550	12,498	2,945	[a]5,070	2,175	......	......	......
3	3,400	2,341	2,925	2,997	[a]2,376	12,864	2,870	2,489	2,155	......	......	......
4	3,435	3,030	2,244	2,753	2,431	12,326	3,350	2,117	2,178	......	......	......
5	[a]2,482	3,108	2,517	[a]2,556	2,923	10,329	[a]3,387	2,179	2,175	......	......	......
6	3.144	3,104	3,164	3,212	3,049	9,626	3,781	2,325	[a]2,165	......	......	......
7	3,160	3,093	3,157	3,692	2,545	[a]9,237	3,475	2,619	1,991	......	......	......
8	3,455	3,119	[a]2,685	3,778	2,575	8,926	2,935	2,305	2,067	......	......	......
9	3,367	[a]1,660	2,899	3,689	2,593	9,193	3,950	[a]2,250	2,205	......	......	......
10	3,474	2,346	3,111	3,497	[a]10,835	9,326	5,005	1,857	2,200	......	......	......
11	3,427	3,052	3,169	3,421	14,928	9,481	3,917	2,095	2,025	......	......	......
12	[a]2,878	3,042	3,160	[a]3,158	17,370	9,462	[a]3,605	2,140	2,143	......	......	......
13	3,231	3,081	3,135	3,470	17,393	8,724	3,430	2,387	[a]2,077	......	......	......
14	3,449	2,945	3,126	3,551	17,396	[a]7,030	3,994	2,085	2,102	......	......	......
15	3,519	2,949	[a]2,686	3,363	17,587	5,890	3,975	2,193	2,048	......	......	......
16	3,524	[a]2,505	2,965	2,649	18,705	4,061	4,065	[a]2,425	2,081	......	......	......
17	3,487	2,722	3,129	2,595	[a]18,350	4,640	4,767	2,370	1,623	......	......	......
18	3,408	2,937	3,096	2,550	16,831	4,510	4,721	2,312	1,590	......	......	......
19	[a]2,772	2,934	3,167	[a]2,190	16,253	4,490	[a]5,060	2,362	1,659	......	......	......
20	2,437	2,961	3,184	2,577	16,299	4,505	4,334	2,365	[a]1,940	......	......	......
21	3,072	3,101	3,060	2,686	14,757	[a]4,331	4,651	2,425	1,930	......	......	......
22	3,117	3,146	[a]2,851	2,869	13,501	3,600	3,120	2,430	1,945	......	......	......
23	3,147	[a]2,635	2,954	2,581	13,002	4,841	3,072	[a]2,490	1,945	......	......	......
24	3,094	2,852	3,135	2,421	[a]12,794	4,449	2,485	2,310	2,015	......	......	......
25	3,034	3,098	3,096	2,443	8,840	2,885	2,610	2,568	1,935	......	......	......
26	[a]1,160	3,102	3,106	[a]2,201	6,472	3,170	[a]2,632	2,508	1,975	......	......	......
27	2,395	3,103	3,151	2,712	8,516	3,123	2,955	2,535	[a]1,925	......	......	......
28	3,039	3,117	3,147	2,821	8,434	[a]3,482	4,078	2,678	1,945	......	......	......
29	3,112	3,195	[a]2,683	2,621	7,476	5,228	4,370	2,232	1,755	......	......	......
30	3,126	......	2,938	2,619	7,272	4,498	4,873	[a]2,145	1,912	......	......	......
31	3,120	......	3,125	......	[a]8,223	......	5,100	1,753	......	......	......	......

[a] Sunday. [b] Records incomplete.

NOTE.—Owing to incompleteness of records on missing days during 1907–8 the discharge could not be computed.

Daily discharge, in second-feet, of West Branch of Penobscot River at Millinocket, 1901–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
1	2,005	447	1,150	1,455	6,445	6,740	3,310	a3,925	2,270	2,270	2,000	2,290
2	1,957	568	1,453	1,460	a 6,400	6,760	3,340	2,720	2,265	2,270	2,265	2,295
3	a2,011	563	1,453	1,458	5,350	6,780	3,925	3,570	2,240	a2,280	2,280	2,280
4	1,527	563	1,449	a 1,458	3,060	6,770	a3,190	3,210	2,320	2,120	2,280	2,230
5	1,920	564	1,420	1,130	2,700	6,760	2,000	2,875	a2,285	2,275	2,275	a2,280
6	1,875	569	1,440	1,455	2,700	a 6,730	2,235	2,375	1,755	2,240	2,270	2,090
7	1,938	a 545	a 1,440	1,462	2,720	6,005	3,159	2,450	1,862	2,218	a2,275	2,260
8	1,955	486	1,177	1,840	2,730	5,895	3,259	a2,120	2,248	2,228	1,950	2,210
9	1,960	543	1,460	1,861	a 3,254	5,890	3,049	1,540	2,270	2,220	2,280	2,250
10	a1,910	537	1,298	1,861	2,970	5,850	2,701	2,130	2,460	a2,220	2,275	2,275
11	1,775	489	1,430	a 1,875	3,338	5,060	a3,223	1,920	2,685	2,090	2,230	2,230
12	1,910	533	1,430	1,393	3,590	4,355	2,600	2,100	a2,570	2,220	2,280	a2,090
13	1,980	510	1,460	1,860	3,740	a 3,235	3,350	2,670	1,550	2,220	2,220	2,075
14	1,867	a 540	a 1,460	1,857	3,870	3,465	3,380	2,315	2,455	2,220	a2,270	2,255
15	1,700	415	1,137	2,120	5,305	3,598	3,140	a2,625	2,750	2,230	2,020	2,255
16	1,802	813	1,380	2,270	a13,430	3,695	3,166	1,735	2,340	2,275	2,270	2,270
17	a1,730	987	975	2,275	16,230	3,506	3,105	2,240	2,305	a2,340	2,265	2,260
18	1,412	1,009	1,466	a 2,630	18,070	4,275	a2,788	2,110	2,365	2,250	2,270	2,265
19	1,568	1,011	1,463	1,917	19,075	6,115	3,145	2,180	a2,480	2,275	2,270	a2,275
20	1,485	990	1,460	2,660	20,200	a 3,757	3,000	2,210	2,120	2,275	2,270	2,090
21	1,020	a 890	a 1,485	2,660	21,000	3,560	3,240	2,213	2,445	2,275	a2,270	2,250
22	687	1,040	1,167	2,640	19,432	3,830	3,200	a2,220	2,260	2,255	1,985	2,245
23	635	1,360	1,497	2,600	a16,775	3,600	3,130	1,870	2,245	2,270	2,270	2,210
24	a 545	1,358	1,485	2,640	15,840	3,510	3,345	2,065	2,240	a2,275	2,200	2,280
25	447	1,302	1,460	a 2,645	14,585	3,440	a4,050	2,200	2,245	2,395	2,190	1,740
26	576	1,400	1,198	1,920	12,705	3,150	4,334	2,175	a2,155	2,275	2,280	a1,570
27	556	1,365	1,203	3,665	11,095	a 3,260	5,280	2,150	2,015	2,260	2,240	2,060
28	531	a1,375	a 1,500	5,515	10,450	3,015	4,288	2,190	2,278	2,275	a2,245	2,245
29	564	....	892	6,130	8,355	2,990	3,500	a2,230	2,265	2,275	1,960	2,215
30	572	....	1,450	6,380	a 7,090	3,400	3,460	1,300	2,256	2,260	2,275	2,230
31	a 570	....	1,455	....	7,045	....	3,635	2,195	....	a2,245	....	2,230

a Sunday.

Monthly discharge of West Branch of Penobscot River at Millinocket, 1901–1909.

[Drainage area, 1,880 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1901.					
January 11-31	2,060	960	1,430	0.761	0.59
February	2,360	1,050	1,630	.867	.90
March	2,030	1,160	1,620	.862	.99
April	22,100	1,370	9,450	5.03	5.61
May	20,200	1,520	6,580	3.50	4.04
June	3,370	2,240	2,650	1.41	1.57
July	8,140	1,540	3,600	1.91	2.20
August	6,500	1,690	2,580	1.37	1.58
September	4,470	1,360	2,600	1.38	1.54
October	2,000	610	1,360	.723	.83
November	1,230	330	656	.349	.39
December	2,000	410	1,160	.617	.71
The year	22,100	330	2,940	1.56	20.95

Monthly discharge of West Branch of Penobscot River at Millinocket, 1901–1909—Con.

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1902.					
January	3,270	1,740	2,130	1.13	1.30
February	3,440	1,870	2,270	1.21	1.26
March	9,970	2,100	5,380	2.86	3.30
April	15,000	6,770	11,800	6.28	7.01
May	16,900	3,090	9,460	5.03	5.80
June	20,600	2,870	9,390	4.99	5.57
July	3,040	330	2,400	1.28	1.48
August	4,380	1,570	2,620	1.39	1.60
September	2,640	1,780	2,170	1.15	1.28
October	2,770	1,940	2,290	1.22	1.41
November	4,860	1,350	2,450	1.30	1.45
December	5,390	570	2,660	1.41	1.63
The year	20,600	330	4,580	2.44	33.09
1903.					
January	2,330	460	1,630	.867	1.00
February	2,310	1,000	1,860	.989	1.03
March	21,000	750	5,770	3.07	3.54
April	24,200	9,100	13,300	7.07	7.89
May	12,300	1,520	6,450	3.43	3.95
June	2,610	750	2,120	1.13	1.26
July	5,170	1,020	2,430	1.29	1.49
August	6,750	660	3,330	1.77	2.04
September	3,340	410	1,920	1.02	1.14
October	1,410	230	790	.420	.48
November	960	50	387	.206	.23
December	960	50	429	.228	.26
The year	24,200	50	3,370	1.79	24.31
1904.					
January	450	141	328	.174	.20
February	448	188	365	.194	.21
March	828	109	527	.280	.32
April	1,810	221	1,000	.532	.59
May	11,700	2,040	5,090	2.71	3.12
June	5,340	2,280	3,690	1.96	2.19
July	4,890	2,000	3,200	1.70	1.96
August	4,990	2,000	3,400	1.81	2.09
September	2,650	2,000	2,150	1.14	1.27
October	3,000	2,000	2,210	1.18	1.36
November	2,560	2,000	2,300	1.22	1.36
December	2,550	2,000	2,160	1.15	1.33
The year	11,700	109	2,200	1.17	16.00
1905.					
January	2,600	2,070	2,230	1.19	1.37
February	2,520	1,970	2,180	1.16	1.21
March	2,580	1,040	1,720	.915	1.05
April	2,620	1,020	2,220	1.18	1.32
May	9,440	2,230	6,050	3.22	3.71
June	8,910	1,970	2,660	1.41	1.57
July	4,180	2,020	2,400	1.28	1.48
August	5,300	2,030	3,070	1.63	1.88
September	2,520	1,940	2,300	1.22	1.36
October	2,510	355	1,470	.782	.90
November	470	343	432	.230	.26
December	457	140	409	.218	.25
The year	9,440	140	2,260	1.20	16.36

Monthly discharge of West Branch of Penobscot River at Millinocket, 1901–1909—Con.

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1906.					
January	1,200	195	403	0.214	0.25
February	998	480	746	.397	.41
March	821	549	688	.366	.42
April	2,500	520	1,200	.638	.71
May	18,600	2,480	6,900	3.67	4.23
June	6,690	2,750	4,820	2.56	2.86
July	7,710	2,420	3,630	1.93	2.22
August	6,330	2,030	3,220	1.71	1.97
September	2,060	1,980	2,030	1.08	1.20
October	2,060	1,980	2,040	1.09	1.26
November	2,080	2,010	2,060	1.10	1.23
December	2,060	1,990	2,030	1.08	1.24
The year	18,600	195	2,480	1.32	18.00
1907.[a]					
January (25 days)	2,080	2,000	2,030	1.08	1.24
February (26 days)	2,030	753	1,510	.803	.84
March	849	193	380	.202	.23
April (29 days)	2,520	324	1,440	.766	.85
May	15,200	2,510	7,060	3.76	4.34
June	13,200	2,740	6,930	3.69	4.12
July	7,320	2,210	5,210	2.77	3.19
August (30 days)	5,700	2,110	3,480	1.85	2.13
September	2,260	2,000	2,140	1.14	1.27
October (28 days)	8,110	2,000	2,710	1.44	1.66
November (29 days)	9,200	2,170	7,190	3.83	4.27
December	7,940	2,490	4,510	2.40	2.77
The year	15,200	193	3,720	1.98	26.91
1908.[b]					
January	3,570	1,600	3,130	1.66	1.91
February	3,200	1,650	2,860	1.52	1.64
March	3,180	2,240	2,990	1.59	1.83
April	3,780	2,190	2,930	1.56	1.74
May	18,700	2,380	10,200	5.43	6.26
June	12,900	2,880	6,910	3.68	4.11
July	5,100	2,480	3,790	2.02	2.33
August	5,170	1,750	2,490	1.32	1.52
September	2,200	1,590	2,000	1.06	1.18
October	....	....	2,000	1.06	1.22
November	....	....	2,000	1.06	1.18
December	....	....	2,000	1.06	1.22
The year	18,700	....	3,610	1.92	26.14
1909.					
January	2,010	447	1,390	.739	.85
February	1,400	415	813	.432	.45
March	1,500	892	1,360	.723	.83
April	6,380	1,130	2,440	1.30	1.45
May	21,000	2,700	9,340	4.97	5.73
June	6,780	2,990	4,630	2.46	2.74
July	5,280	2,000	3,310	1.76	2.03
August	3,920	1,300	2,320	1.23	1.42
September	2,750	1,550	2,270	1.21	1.35
October	2,395	2,090	2,250	1.20	1.38
November	2,280	1,950	2,210	1.18	1.32
December	2,300	1,570	2,190	1.16	1.34
The year	21,000	415	2,880	1.53	20.89

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[a] For purposes of comparison with other stations, the annual discharge for 1907 has been computed on the assumption that no difference exists between the mean discharge for partial months as given above and the true mean discharge for the same months with full number of days.

The mean discharge for the partial months as given above is in most cases in excess of the actual discharge for the full month, owing to storage of water during the days when the records were incomplete. The annual discharge is probably about 1 or 2 per cent in excess from this cause.

[b] Owing to inaccurate records the discharge is only approximate during October, November, and December, 1908.

NOTE.—Discharges for missing days have been interpolated.

PENOBSCOT RIVER AT WEST ENFIELD.

This station was established November 5, 1901, and prior to 1904 was designated as being at Montague, Me. In 1904 the name of the village was changed to West Enfield. It is located at the steel highway bridge about 1,000 feet below the mouth of Piscataquis River. (See Pl. VI.) There is a dam on Piscataquis River near its entrance into the Penobscot, and about a mile above the station is the dam of the International Paper Co., on the main river. During low water gage heights show considerable daily fluctuations, owing to the variations in gate openings at the mills above.

The datum of the gage has remained the same during the maintenance of the station. It is 125.38 feet above sea level, as determined by the Penobscot River survey of 1904. During the winter months the discharge is affected by ice. Conditions for obtaining accurate discharge data are good and a fairly good rating curve has been developed.

Discharge measurements of Penobscot River at West Enfield, 1901–1909.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
1901.	*Feet.*	*Second-feet.*	1906.	*Feet.*	*Second-feet.*
Nov. 5	2.00	3,030	Sept. 22 [a]	2.60	4,130
			Sept. 26 [a]	2.40	3,640
1902.			Sept. 29 [a]	2.30	3,590
Mar. 28	12.80	57,400	Oct. 4 [a]	2.10	3,210
Apr. 8	10.90	43,900	Oct. 6 [a]	2.05	2,940
July 15	5.10	11,300	Oct. 11 [a] [b]	6.80	18,600
Aug. 28	3.80	7,580	Oct. 13 [c]	5.60	12,600
Sept. 15	3.90	7,770	Oct. 24	4.15	8,320
Oct. 11	3.75	7,450	Oct. 31 [c]	5.65	12,800
1903.			1907.		
May 14	6.65	17,600	Sept. 25 [c]	4.60	9,470
May 25	4.10	8,410	Sept. 28	4.25	8,360
June 11	3.21	5,910	Oct. 3 [c]	4.00	7,260
Aug. 7	3.22	6,140	Oct. 5 [c]	4.85	10,000
Oct. 15	1.54	2,070	Oct. 11 [c]	6.55	17,000
Oct. 23	1.58	2,370	Oct. 21	3.50	7,040
1904.			1908.		
Apr. 26	9.70	32,200	Sept. 26 [c]	2.20	3,440
May 18	12.06	49,200	Sept. 30 [a]	1.52	2,160
May 27	8.01	22,100	Oct. 3 [a]	2.30	3,630
June 14	5.82	13,400	Oct. 7 [a]	2.50	3,980
Oct. 17	4.23	8,100	Oct. 15 [a]	2.30	3,650
Oct. 20	3.90	7,200	Oct. 21 [c]	2.14	3,250
Oct. 25	5.25	10,800	Nov. 3	2.96	5,380
Oct. 31	4.73	9,600	Nov. 3	2.99	5,370
1905.			1909.		
Apr. 17	9.00	27,200	May 25	10.02	33,500
May 1	6.40	15,900	Sept. 25 [a]	2.45	4,230
Sept. 29	2.70	4,050	Oct. 1 [c] [d]	13.07	52,900
Sept. 30	2.65	4,060	Oct. 2 [c] [d]	11.07	40,000
Oct. 3	2.40	3,960	Oct. 7 [c] [d]	7.66	21,400
Oct. 5	2.12	3,390	Oct. 9 [c]	6.73	17,200
Oct. 18	1.90	2,770	Oct. 28 [c]	4.70	10,100
Oct. 19	1.90	2,840			
Oct. 24	1.30	1,900			
Oct. 25	1.25	1,870			

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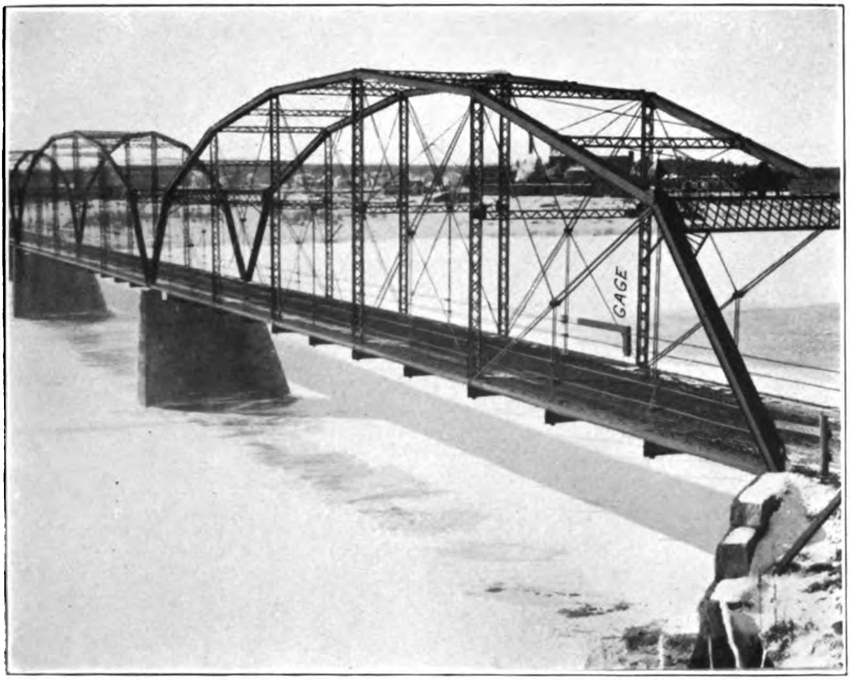
[a] Average of three measurements.

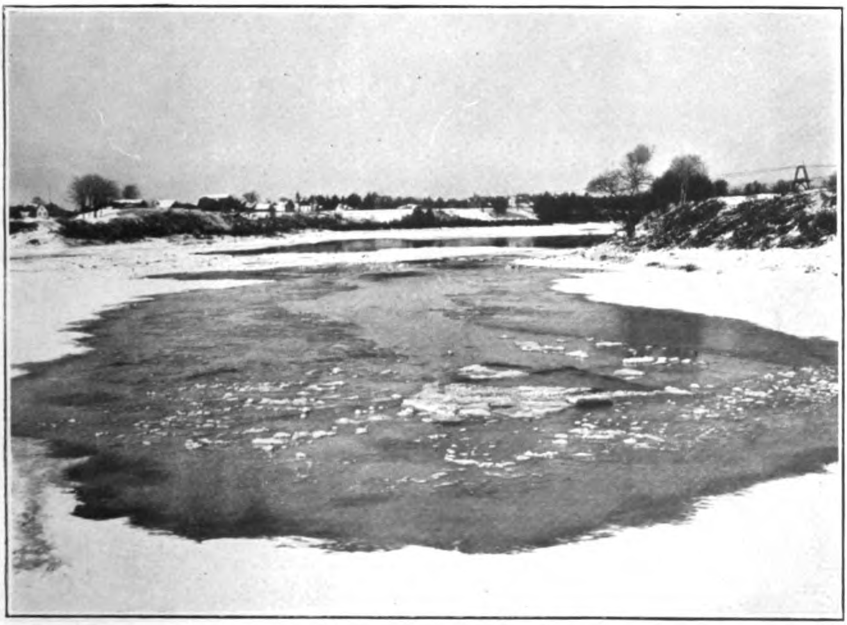
[b] Gage height at beginning 6.5 feet; at end, 7.1 feet; poor measurement.

[c] Average of two measurements.

[d] Center of meter held 2.0 feet below surface and coefficient of 0.9 applied to obtain mean velocity.



A. PENOBSCOT RIVER AT WEST ENFIELD GAGING STATION.



B. PENOBSCOT RIVER AT WEST ENFIELD.

Looking upstream from highway bridge February 8, 1906.

Daily gage height, in feet, of Penobscot River at West Enfield, 1901–1909.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1901.			1901.			1901.		
1		2.0	11	2.5	2.5	21	2.0	7.1
2		2.0	12	2.5	3.3	22	2.0	6.45
3		2.0	13	2.5	3.8	23	2.35	6.0
4		2.0	14	2.3	4.5	24	2.2	5.85
5	2.0	2.0	15	2.2	6.2	25	2.2	5.95
6	2.0	2.0	16	2.2	14.0	26	2.2	6.2
7	2.0	2.0	17	2.1	14.5	27	2.1	5.9
8	2.15	2.0	18	2.2	11.8	28	2.0	5.45
9	2.3	2.0	19	2.2	8.75	29	2.0	5.1
10	2.4	2.1	20	2.2	7.8	30	2.0	5.3
						31		5.4

NOTE.—Discharge probably affected by ice after December 20.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.												
1	5.20	5.05		14.50	9.70	6.25	7.40	5.25	2.15	2.90	6.60	4.10
2	3.95	5.05		13.95	10.65	6.10	7.30	5.15	2.25	3.00	5.90	4.05
3	4.35	5.25		13.35	10.20	6.15	7.35	4.95	2.90	2.85	5.20	3.70
4	4.50	5.10		12.80	9.95	7.45	7.40	4.80	3.25	2.85	4.95	3.35
5	4.30	4.95		12.25	9.70	9.20	7.30	5.05	3.10	2.75	5.05	3.70
6	4.10	4.90		11.40	9.50	10.05	6.95	5.00	3.00	2.55	4.80	3.60
7	4.05	4.80		11.05	9.40	10.15	6.55	4.90	2.95	3.10	4.35	3.50
8	3.60	4.70		10.85	9.30	10.00	6.10	5.00	2.70	3.70	4.15	4.80
9	3.65	(a)		10.65	9.40	11.90	6.05	5.10	2.25	3.95	3.95	(a)
10	3.50			10.80	9.00	12.20	5.85	4.95	2.90	3.85	3.70	
11	3.00			11.05	8.65	11.45	5.60	4.80	3.45	3.65	3.85	
12	2.90			11.15	8.30	10.90	5.05	5.20	3.65	3.10	3.90	
13	2.80			9.95	8.00	10.40	5.20	6.05	3.45	3.05	3.95	
14	2.85			10.70	7.60	10.00	5.95	6.25	3.55	2.85	4.00	
15	2.70			10.35	7.25	9.60	5.10	6.40	3.80	3.10	4.10	
16	2.60			10.30	6.90	9.05	4.60	4.80	3.65	2.95	4.20	
17	2.45			10.15	6.60	8.40	4.70	4.45	3.50	3.00	4.05	
18	2.20			9.95	6.50	8.05	4.75	3.65	3.40	2.95	4.10	
19	2.45			9.45	6.50	7.65	4.90	3.55	3.30	2.80	4.25	
20	2.20			8.65	6.25	7.05	5.05	4.20	3.15	2.75	4.20	
21	2.55			8.75	5.95	6.40	5.70	4.55	3.15	3.30	4.10	
22	2.60			9.00	6.15	6.35	5.90	4.50	3.20	3.90	4.10	
23	3.80			8.90	6.35	7.60	5.65	4.30	3.15	3.70	4.10	
24	6.20			8.80	6.70	7.50	4.75	4.15	3.10	3.30	3.85	
25	6.55			8.90	6.70	7.15	4.50	3.40	3.05	3.05	3.85	
26	5.55			9.00	6.85	7.10	4.60	3.50	3.00	2.85	4.05	
27	5.75			9.05	6.75	9.45	4.35	3.75	2.90	2.85	3.80	
28	6.10		12.70	9.25	6.70	9.75	4.85	3.80	2.75	3.70	3.85	
29	6.25		12.70	9.25	7.00	8.55	5.65	3.50	2.60	7.70	4.30	
30	5.55		14.45	9.20	6.95	7.95	5.70	3.25	2.75	8.00	4.20	
31	5.65		15.00		6.60		5.60	2.75		7.40		
1903.												
1				11.15	8.25	3.60	3.25	4.35	3.15	1.70	1.40	1.80
2				10.90	7.80	3.90	3.30	3.95	3.20	1.60	1.50	1.70
3				10.75	7.35	3.70	3.30	3.70	3.10	1.50	1.55	1.60
4				10.90	7.35	3.40	3.20	3.45	3.25	1.55	1.45	1.65
5				11.45	7.40	3.15	3.35	3.35	2.95	1.50	1.40	1.70
6				11.15	7.15	3.15	3.65	3.25	2.70	1.40	1.30	1.70
7				10.80	7.05	2.80	3.25	3.20	3.00	1.45	1.30	1.60
8				10.80	6.70	2.60	3.45	3.10	3.05	1.45	1.45	1.60
9				11.45	6.85	2.55	3.85	3.15	2.90	1.45	1.70	1.65
10				12.05	6.85	3.10	4.45	3.20	3.00	1.30	1.60	1.70
11			(b)	11.80	6.75	3.05	4.65	3.25	2.75	1.30	1.60	1.70
12			17.55	11.20	6.80	3.20	4.10	3.75	2.60	1.20	1.75	1.85
13			13.30	10.75	6.70	3.65	3.65	3.60	2.70	1.40	2.20	2.40
14			13.10	10.40	6.65	4.75	3.45	3.40	2.60	1.50	2.55	2.50
15			11.80	10.15	6.10	5.55	3.80	3.50	2.65	1.50	2.60	(c)

[a] Frozen Feb. 9 to Mar. 27, and Dec. 9 to 31, 1902.
[b] River frozen Jan. 1 to Mar. 11, 1903.
[c] Readings through ice Dec. 15 to 31.

Daily gage height, in feet, of Penobscot River at West Enfield, 1901–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
16	......	......	11.90	9.90	5.90	4.25	3.60	3.60	2.80	1.50	2.60	......
17	......	......	11.25	9.65	5.70	4.10	4.20	3.55	2.65	1.60	2.50	......
18	......	......	10.80	9.30	5.55	3.90	4.20	3.55	2.65	1.55	2.45	......
19	......	......	10.30	9.15	5.35	3.85	3.80	3.65	2.55	1.60	2.25	......
20	......	......	10.90	9.00	5.00	3.70	3.95	3.95	2.50	1.65	2.10	......
21	......	......	11.40	8.60	4.80	3.55	3.80	4.25	2.60	1.70	2.00	3.30
22	......	......	11.60	8.30	4.75	3.20	3.60	4.30	3.45	1.65	1.90	......
23	......	......	11.85	8.15	4.60	2.80	3.65	3.70	3.20	1.60	1.80	......
24	......	......	12.40	8.15	4.30	3.15	3.60	3.30	2.35	1.65	1.80	......
25	......	......	13.50	8.05	4.05	3.25	3.75	3.40	2.55	1.70	1.70	......
26	......	......	13.40	8.15	4.05	3.10	3.70	3.30	2.20	1.80	1.80	......
27	......	......	13.00	8.25	4.00	3.15	3.60	3.20	1.90	1.70	1.80	......
28	......	......	12.45	8.15	4.00	3.25	3.30	3.10	1.95	1.60	1.80	3.10
29	......	......	11.80	8.25	3.85	3.30	3.65	3.20	2.00	1.50	1.70	......
30	......	......	11.30	8.25	3.70	3.15	4.20	3.15	1.75	1.50	1.80	......
31	......	......	11.15	......	3.45	......	4.90	3.10	......	1.40	......	......
1904.												
1	......	2.80	......	......	12.30	7.20	4.25	4.05	2.80	7.05	4.65	3.20
2	......	......	......	......	12.00	6.80	5.15	3.70	2.70	6.90	4.45	3.15
3	......	......	......	......	11.60	7.75	5.90	4.30	2.80	6.30	4.45	3.40
4	3.50	......	......	6.15	11.20	7.15	6.20	4.70	2.80	5.65	4.30	3.45
5	......	......	......	6.25	11.15	6.50	5.75	4.55	3.55	5.30	4.20	3.50
6	......	......	......	6.50	10.65	6.90	5.45	4.40	3.70	5.05	4.10	3.50
7	......	......	2.70	6.75	10.10	7.20	5.10	4.15	3.65	4.75	4.15	3.45
8	......	2.60	......	7.60	9.10	7.55	4.70	4.05	3.35	4.65	4.50	3.70
9	......	......	......	8.70	8.45	6.95	4.45	4.15	3.20	4.55	4.40	3.85
10	......	......	......	9.65	8.45	6.60	4.35	4.10	3.20	4.35	4.30	4.25
11	3.30	......	......	10.75	10.10	6.50	5.00	4.20	3.10	4.20	4.20	4.25
12	......	......	......	11.20	11.60	6.40	4.35	4.30	3.00	4.15	4.10	4.15
13	......	......	......	11.00	11.80	6.20	4.25	4.20	3.05	4.10	4.05	......
14	......	......	4.90	10.40	10.90	5.90	4.50	4.10	2.75	4.20	4.05	......
15	......	2.40	......	9.85	10.25	5.50	4.75	4.00	3.05	4.20	3.95	......
16	......	......	......	9.05	10.70	5.05	4.25	4.10	4.35	4.15	3.70	......
17	......	......	......	8.30	11.85	4.90	3.85	3.95	4.80	4.15	3.60	......
18	3.40	......	......	7.90	11.90	5.20	4.50	3.75	4.50	4.10	3.50	......
19	......	......	......	7.80	11.55	5.85	3.80	3.50	4.15	4.05	3.60	4.30
20	......	......	......	7.90	11.80	5.50	3.90	3.15	4.25	4.00	3.55	......
21	......	......	4.70	7.80	12.00	5.15	4.05	3.45	4.10	3.90	3.55	......
22	......	2.60	......	7.75	11.20	5.00	4.20	3.85	4.20	4.55	3.90	......
23	......	......	......	7.90	10.60	4.95	3.50	3.55	4.10	5.80	3.85	......
24	......	......	......	8.20	10.45	4.75	3.40	3.40	4.15	5.65	3.85	......
25	3.20	......	......	8.60	9.90	4.55	3.65	3.30	4.75	5.25	3.80	......
26	......	......	......	9.85	8.80	4.65	3.35	3.15	5.30	5.05	3.70	4.30
27	......	......	......	10.15	8.05	4.90	3.80	2.95	5.10	5.45	3.65	......
28	......	......	6.00	10.25	7.95	4.75	4.15	2.70	4.65	5.65	3.40	......
29	......	2.40	......	10.35	7.60	4.15	3.45	2.80	4.85	5.45	3.30	......
30	......	......	......	11.10	7.30	3.75	3.25	2.80	5.45	5.10	3.20	......
31	......	......	......	......	7.35	......	3.30	2.75	......	4.70	......	......

NOTE.—Gage heights affected by ice Jan. 1 to Apr. 9 and Dec. 13 to 31. During frozen season readings are to surface of water in hole cut in the ice.

The following thicknesses of ice were measured:

	Feet.		Feet.
Jan. 4	1.0	Feb. 29	1.65
Jan. 11	1.1	Mar. 7	1.6
Jan. 18	1.15	Mar. 14	1.5
Jan. 25	1.15	Mar. 21	1.4
Feb. 1	1.15	Mar. 28	1.15
Feb. 8	1.25	Dec. 19	.65
Feb. 15	1.35	Dec. 26	.75
Feb. 22	1.5		

Daily gage height, in feet, of Penobscot River at West Enfield, 1901-1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1				12.1	6.65	6.15	2.6	3.8	3.05	2.3	1.3	3.1
2	5.35			12.45	6.7	5.85	2.85	3.65	2.95	2.4	1.45	2.25
3				11.85	6.6	5.45	3.55	3.5	3.05	2.4	1.85	1.9
4				10.55	6.65	5.1	3.75	3.45	3.0	2.35	2.0	2.4
5				10.05	6.6	4.9	4.0	3.65	3.05	2.15	1.8	2.9
6		4.95	4.85	10.0	6.4	4.65	3.6	3.7	3.05	2.15	1.9	2.85
7				10.7	6.2	4.9	3.25	3.1	2.8	1.95	1.95	2.8
8				11.45	6.1	4.7	2.95	3.15	2.55	2.1	1.8	2.7
9	5.75			10.8	6.3	4.35	2.75	3.3	2.4	2.0	1.95	2.7
10				10.15	6.3	4.1	2.95	3.7	2.35	1.9	1.8	2.95
11				9.75	6.2	4.0	3.2	3.45	2.3	2.0	1.7	
12				9.8	6.1	4.3	3.7	2.75	2.2	2.0	1.35	
13		4.85	4.55	9.75	6.45	4.5	3.2	2.55	2.45	2.1	1.65	
14				9.45	6.2	4.65	3.1	2.8	2.1	2.1	1.7	
15				9.25	6.05	4.65	2.95	2.65	2.25	2.2	1.35	
16	5.65			9.1	6.35	4.6	2.65	2.55	2.2	2.15	1.3	
17				8.9	6.4	4.6	3.35	2.95	2.15	2.0	1.9	
18				8.55	6.8	4.25	3.45	3.2	2.35	1.9	2.0	
19				8.0	7.4	3.95	3.2	3.2	2.5	1.9	2.1	
20		4.75	4.28	7.65	8.05	4.0	3.1	3.05	2.6	1.9	2.25	
21			4.35	7.6	7.85	3.85	3.0	3.1	2.6	1.65	2.05	
22			4.5	7.95	7.55	3.75	2.9	2.65	2.6	1.3	1.9	
23	5.65		4.45	8.1	7.35	3.65	2.9	2.45	2.45	1.6	1.8	
24	5.65		4.6	8.1	7.05	3.4	3.2	2.25	2.35	1.3	1.8	
25	5.55		4.75	7.85	7.1	3.25	3.15	2.05	2.65	1.25	1.5	
26	5.65		5.35	7.65	7.1	3.15	3.35	2.05	2.5	1.2	1.15	2.4
27	5.55	5.15	5.75	7.35	7.05	3.35	3.2	2.45	2.5	1.3	1.7	
28			6.35	7.4	6.9	3.35	3.15	2.65	2.6	1.3	2.15	
29			7.5	7.1	6.7	3.05	3.25	2.7	2.65	1.0	1.8	
30	5.45		8.8	6.85	6.45	2.95	3.3	2.55	2.55	1.2	2.0	
31			10.65		6.1		3.45	2.8		1.3		

NOTE.—River was frozen Jan. 1-21, open Jan. 22-25, frozen Jan. 26 to Mar. 19, and open at the gage Mar. 20 to Apr. 10. The ice broke up at the bridge Mar. 31. Jam of ice below the gage Apr. 1-10. River clear of ice Apr. 11. River frozen Dec. 1-31, but open at the gage until Dec. 11. During frozen periods gage heights are to the surface of the water in a hole cut in the ice.

The following thicknesses of ice were measured:

	Foot.		Foot.
Jan. 2	0.8	Feb. 13	0.75
Jan. 9	.75	Feb. 20	.8
Jan. 16	.6	Feb. 27	.7
Jan. 27	.3	Mar. 6	.4
Jan. 30	.5	Mar. 13	.3
Feb. 6	.7	Dec. 26 (gage height to top of ice 2.6 feet)	.8

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
1					11.45	7.65	4.25	4.5	3.45	2.1	5.45	4.2
2	2.3				11.95	7.5	3.75	4.4	3.0	2.2	5.4	4.35
3				[1] 5.8	12.35	7.45	4.55	4.25	2.95	2.2	5.85	4.7
4				5.9	12.5	7.55	4.25	4.0	3.15	2.1	6.15	5.1
5				6.05	12.4	7.3	4.5	3.9	3.4	2.0	5.95	6.0
6		4.9	3.9	6.25	12.35	7.2	4.7	3.75	3.25	2.1	5.65	6.0
7				6.6	12.25	7.7	4.25	3.65	3.1	2.1	5.4	6.0
8				6.7	12.3	6.9	4.4	3.85	3.0	2.3	5.1	5.9
9	2.2			6.65	12.1	6.8	5.15	3.95	2.75	2.3	5.0	5.9
10				6.7	12.25	6.7	4.85	4.05	2.6	2.8	4.75	5.9
11				6.75	13.4	6.65	4.25	3.9	2.6	6.3	4.7	5.7
12				6.3	12.2	6.65	3.75	3.95	2.65	6.6	4.7	
13		4.6		6.1	11.45	6.4	4.65	3.7	2.5	5.55	4.8	
14			4.4	6.3	11.35	5.4	5.5	3.6	2.6	5.0	4.7	
15				6.85	11.65	4.5	5.2	3.35	2.55	4.5	4.9	
16	2.8			9.4	11.2	4.05	4.5	3.35	2.4	4.35	5.0	
17				11.45	11.6	4.25	4.15	3.35	2.4	4.15	5.25	5.0
18				12.15	11.3	4.7	4.15	3.4	2.3	3.9	5.25	
19			4.1	12.05	11.4	4.7	4.05	3.05	2.3	3.75	5.25	
20				11.95	10.75	4.75	4.0	3.3	2.35	3.55	5.5	

Daily gage height, in feet, of Penobscot River at West Enfield, 1901–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
21	......	......	......	11.6	10.0	4.9	4.0	3.4	2.6	3.45	5.4	......
22	......	3.8	......	11.65	8.85	5.55	4.05	3.5	2.55	3.5	5.5	......
23	3.8	......	......	11.65	7.8	5.85	4.5	3.55	2.3	3.75	5.35	......
24	5.2	......	......	11.25	8.35	5.4	4.4	3.8	2.4	4.15	5.25	6.0
25	6.6	......	......	10.8	8.75	5.06	4.3	3.5	2.4	4.4	4.75	......
26	7.3	......	4.0	10.8	8.2	5.45	4.05	3.3	2.35	5.4	4.5	......
27	......	4.1	4.2	10.85	7.75	5.05	3.85	3.45	2.35	6.0	4.4	......
28	......	......	......	10.9	7.65	4.7	3.75	3.65	2.3	6.05	4.0	......
29	......	......	......	11.1	7.8	4.35	4.0	3.8	2.3	6.2	4.0	......
30	6.0	......	......	11.25	8.0	4.7	3.5	3.9	2.2	6.15	4.25	......
31	......	......	......	......	8.15	......	4.2	4.1	......	5.6	......	5.5

NOTE.—The following ice conditions prevailed during 1906:

River frozen from Jan. 1 to Apr. 15, except that narrow channel remained open near the right bank; river again frozen Dec. 4–31, inclusive.

During frozen period gage heights were taken to water surface through a hole in the ice. The following comparative readings were taken:

Date.	Water surface.	Top of ice.	Thickness of ice.	Date.	Water surface.	Top of ice.	Thickness of ice.
	Feet.	*Feet.*	*Feet.*		*Feet.*	*Feet.*	*Feet.*
Jan. 2	2.3	......	0.9	Mar. 6	3.9	4.0	(a)
Jan. 9	2.2	......	1.0	Mar. 14	4.4	4.0	(a)
Jan. 16	2.8	......	.9	Mar. 19	4.1	4.2	1.8
Jan. 23	3.8	4.0	.8	Mar. 26	4.0	3.9	1.7
Jan. 25	6.6	6.8	.6	Apr. 3 [b]	......	5.8	......
Jan. 30	6.0	6.2	.6	Dec. 10	5.9	5.7	[c] .6
Feb. 8	4.65	4.7	1.2	Dec. 17	5.0	5.1	[c] .8
Feb. 13	4.6	4.7	1.3	Dec. 24	6.0	6.1	[c] .8
Feb. 22	3.8	3.9	1.0	Dec. 31	5.5	5.6	[c] .6
Feb. 27	4.1	4.2	(a)				

[a] Open water in places and water on ice; unsafe to go upon.

[b] River open on east side under gage.

[c] River not entirely frozen over.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.[a]												
1	......	......	......	6.9	16.6	8.55	8.9	5.7	3.45	4.2	6.1	6.55
2	......	......	......	7.2	17.1	8.35	9.3	5.85	3.3	4.1	5.9	6.3
3	......	......	......	7.05	16.25	8.0	9.45	6.1	3.4	4.1	6.65	6.1
4	......	......	......	7.05	14.65	7.75	8.85	5.6	3.55	4.4	7.35	6.1
5	......	......	......	7.25	13.85	7.55	8.45	5.35	4.05	4.65	7.45	5.9
6	......	......	......	7.55	12.95	7.6	8.45	6.15	5.15	4.4	7.0	5.35
7	......	......	......	8.0	12.15	8.75	7.65	7.0	5.35	4.25	7.45	4.45
8	......	......	......	8.2	11.7	8.55	7.2	7.1	4.9	4.45	11.2	4.25
9	......	......	......	8.25	11.35	8.45	7.1	6.6	4.5	6.65	10.95	4.1
10	......	......	......	8.15	10.85	8.6	7.05	5.85	4.35	7.0	10.2	4.7
11	......	......	......	7.75	10.0	8.2	6.85	5.4	3.95	6.45	9.8	8.35
12	......	......	......	7.6	9.45	7.5	6.55	5.1	4.05	5.65	9.4	10.6
13	......	......	......	7.5	9.1	6.9	6.35	5.05	4.25	5.3	9.1	9.45
14	......	......	......	7.65	8.85	6.5	6.2	4.95	4.0	5.2	8.75	8.25
15	......	......	......	7.85	8.7	6.25	6.15	4.8	3.75	5.1	8.5	7.25
16	......	......	......	8.3	8.8	6.05	6.45	4.7	3.6	5.1	8.1	7.6
17	......	......	......	8.5	8.75	5.9	6.45	4.65	3.5	4.95	7.75	7.7
18	......	......	......	8.0	9.25	5.95	5.9	4.6	3.5	4.65	7.45	7.65
19	......	......	......	8.1	9.75	5.85	5.45	4.55	3.4	4.1	7.25	7.35
20	......	......	......	8.05	10.15	5.7	5.15	4.5	3.3	3.7	7.1	6.5
21	......	......	......	8.3	9.65	5.6	5.15	4.4	3.45	3.5	7.0	5.9
22	......	......	......	8.3	9.15	5.35	5.5	4.2	3.25	3.45	6.85	5.65
23	......	......	......	8.55	8.65	4.9	5.4	3.95	3.15	3.75	6.75	5.35
24	......	......	......	10.15	8.35	5.05	5.5	4.3	3.55	3.65	6.7	6.55
25	......	......	......	12.25	8.35	5.85	5.55	4.05	4.45	3.9	6.55	6.7

[a] River frozen Jan. 1 to Apr. 22, 1907, and from Jan. 20 to Mar. 27, and Dec. 4 to 31, 1908. River open at the gage Apr. 1 to 22, 1907. Gage readings Dec. 7 to 31, 1908, to water surface in a hole cut in the ice.

Daily gage height, in feet, of Penobscot River at West Enfield, 1901-1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.[a]												
26	......	......	......	12.9	8.05	6.8	5.9	3.95	4.8	3.95	6.75	6.85
27	......	......	......	13.3	7.85	7.25	6.35	4.0	4.7	4.15	6.9	6.9
28	......	......	......	13.7	8.5	9.25	6.5	3.9	4.25	4.25	6.9	6.55
29	......	......	......	15.05	8.85	9.35	6.15	3.8	3.85	4.35	6.8	5.75
30	......	......	6.2	15.75	9.15	9.15	5.85	3.75	3.95	6.6	6.7	5.45
31	......	......	......	......	8.8	......	5.8	3.65	......	6.8	......	5.1
1908.[a]												
1	6.1	......	......	8.4	13.15	9.75	4.4	3.85	3.25	1.5	2.78	2.85
2	6.1	......	......	8.1	14.4	10.95	4.25	3.7	3.25	2.15	2.66	2.96
3	5.85	......	......	7.55	14.0	10.5	3.7	3.3	3.35	2.3	2.72	2.64
4	5.65	......	......	7.8	13.45	10.2	3.4	3.05	3.35	2.45	2.66	2.90
5	5.45	......	......	7.4	12.5	9.6	3.15	2.8	3.35	2.6	2.76	......
6	5.2	......	......	6.7	12.0	8.65	3.35	2.85	3.45	2.6	2.70	......
7	4.85	......	......	6.4	11.25	8.2	3.5	3.4	3.25	2.5	2.55	3.1
8	4.7	......	......	6.4	10.6	7.75	3.65	3.5	3.0	2.4	2.40	......
9	4.75	......	......	6.5	10.3	7.4	4.2	3.4	3.0	2.3	2.11	......
10	5.4	......	......	6.4	11.0	7.2	4.6	3.35	2.9	2.2	2.14	......
11	5.15	......	......	6.5	11.6	7.05	4.3	3.25	2.75	2.1	2.46	......
12	4.85	......	......	6.4	11.8	6.85	4.15	3.15	2.6	2.2	2.51	......
13	4.55	......	......	6.5	12.2	6.45	4.0	3.05	2.7	2.2	2.56	......
14	4.5	......	......	6.5	11.75	5.8	4.25	2.95	2.75	2.3	2.57	3.3
15	4.95	......	......	6.5	11.2	5.65	4.0	3.25	2.75	2.2	2.62	......
16	5.25	......	......	6.7	10.8	5.5	4.35	3.45	2.85	2.3	2.37	3.9
17	5.5	......	......	7.0	10.8	5.45	4.45	3.7	2.7	2.3	2.45	3.8
18	5.85	......	......	6.9	10.9	5.4	4.55	3.75	2.6	2.2	2.66	3.9
19	5.85	......	......	6.75	10.6	5.25	4.5	3.95	2.45	2.15	2.66	3.8
20	......	......	......	6.55	10.2	5.0	4.6	4.05	2.5	2.2	2.71	3.8
21	......	......	......	6.5	9.6	5.1	4.9	3.8	2.4	2.2	2.64	3.9
22	......	......	......	6.4	8.8	5.2	4.55	3.75	2.3	2.1	2.38	3.8
23	......	......	......	6.55	8.5	5.25	4.35	3.5	2.2	2.1	2.03	3.7
24	......	......	......	7.25	8.25	4.95	4.15	3.25	2.2	1.95	2.35	3.6
25	......	......	......	8.1	7.9	4.8	4.0	3.4	2.3	1.55	2.40	3.6
26	......	......	......	8.6	7.6	4.9	3.85	3.35	2.15	1.4	2.37	3.5
27	......	......	......	9.75	7.7	4.75	3.8	3.35	1.45	1.9	2.67	3.6
28	......	......	8.8	11.7	7.8	4.4	4.0	3.35	1.05	2.54	2.94	3.7
29	......	......	8.9	13.3	7.6	4.15	3.9	3.3	1.25	2.88	2.86	3.6
30	......	......	8.85	13.25	7.5	4.45	3.8	3.2	1.5	2.74	2.77	3.6
31	......	......	8.45	......	7.85	......	3.85	3.2	......	2.78	......	3.7
1909.[b]												
1	3.6	4.9	7.4	9.55	10.65	7.5	4.55	3.3	2.8	12.86	3.99	6.3
2	3.5	4.6	7.3	9.45	10.5	7.25	4.65	3.25	2.9	11.05	3.98	6.0
3	3.4	4.5	7.1	9.35	10.45	6.9	4.5	3.2	3.15	10.05	4.16	5.88
4	3.5	4.7	7.0	9.00	10.45	6.65	4.4	3.15	3.2	9.2	5.22	5.78
5	3.5	5.4	6.8	9.35	10.85	6.3	4.35	3.1	3.3	8.4	5.78	5.74
6	4.2	5.1	6.7	9.7	10.85	5.7	4.3	2.8	3.3	8.18	5.68	5.72
7	5.1	4.9	6.7	10.2	10.9	5.6	4.3	2.5	3.8	7.62	5.65	5.78
8	7.7	4.7	6.6	11.5	11.0	5.9	4.4	2.3	3.65	7.28	5.18	5.62
9	7.3	4.7	6.5	11.7	11.2	6.4	4.5	2.2	3.5	6.68	5.10	5.45
10	6.6	4.8	6.4	11.9	11.7	6.15	4.7	2.35	3.4	6.1	5.09	5.74
11	6.3	4.9	6.1	11.25	12.3	5.9	4.45	2.45	3.6	5.7	4.95	4.30
12	6.0	4.9	6.1	10.35	12.4	5.6	4.25	2.55	3.62	5.45	4.75	4.0
13	5.8	4.8	6.0	10.8	11.95	5.25	4.15	2.7	3.7	5.12	4.48	3.6
14	5.6	4.8	5.8	12.55	11.6	4.65	4.0	2.55	3.7	4.78	4.44	4.15
15	5.4	4.6	5.6	13.6	11.5	4.45	3.9	2.45	3.7	4.7	4.40	4.42
16	5.2	4.6	5.6	15.0	11.95	4.25	4.1	2.4	3.68	4.7	4.38	4.45
17	5.1	4.6	5.65	15.2	12.35	4.35	4.2	2.3	3.68	4.65	4.32	4.4
18	4.9	4.5	5.5	14.35	11.95	5.25	3.95	2.5	3.6	4.65	4.38	4.48
19	4.7	4.6	5.4	14.0	12.0	6.95	3.8	2.7	3.52	4.45	4.40	4.25
20	5.0	4.8	5.4	14.35	11.8	6.65	4.2	2.85	3.38	4.28	4.28	4.0
21	5.3	5.3	5.3	14.3	11.45	5.75	4.2	2.95	3.05	4.21	4.15	3.85
22	4.9	5.6	5.3	14.25	10.85	5.4	4.1	3.05	2.58	4.2	4.02	3.82
23	4.9	6.6	5.4	14.05	10.45	5.3	4.25	2.95	2.5	4.14	4.10	3.8
24	4.8	7.1	5.6	13.75	10.15	5.2	4.2	3.1	2.4	4.12	4.24	3.72
25	4.6	7.3	5.8	13.5	10.2	4.9	4.0	3.2	2.4	4.28	4.38	3.5
26	4.5	7.8	5.7	12.45	9.8	4.75	3.95	3.4	2.4	4.66	5.10	3.48
27	4.5	7.9	6.4	12.0	9.1	4.6	4.2	3.6	2.6	4.7	8.12	3.65
28	4.4	7.6	7.0	11.65	8.8	4.4	4.35	3.4	6.5	4.64	7.85	3.32
29	4.5	......	7.7	11.6	8.65	4.35	3.9	3.1	14.35	4.41	7.48	4.52
30	4.6	......	9.0	11.4	8.55	4.6	3.55	2.95	16.6	4.22	6.80	5.0
31	4.8	......	9.4	......	7.7	......	3.45	2.85	......	4.12	......	5.38

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[a] River frozen Jan. 1 to Apr. 22, 1907, and from Jan. 20 to Mar. 27, and Dec. 4 to 31, 1908. River open at the gage Apr. 1 to 22, 1907. Gage readings Dec. 7 to 31, 1908, to water surface in a hole cut in the ice.

[b] Gage heights affected by ice from Jan. 1 to about Apr. 23, 1909, also during the last few days of December, 1909.

Rating tables for Penobscot River at West Enfield.

1901-1908.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1.00	1,630	2.50	3,920	3.90	7,330	6.60	16,550
1.10	1,710	2.60	4,130	4.00	7,620	6.80	17,390
1.20	1,810	2.70	4,340	4.20	8,210	7.00	18,260
1.30	1,930	2.80	4,560	4.40	8,810	8.00	23,200
1.40	2,060	2.90	4,790	4.60	9,430	9.00	29,000
1.50	2,200	3.00	5,020	4.80	10,070	10.00	35,450
1.60	2,350	3.10	5,260	5.00	10,720	11.00	42,350
1.70	2.500	3.20	5,500	5.20	11,380	12.00	49,750
1.80	2,660	3.30	5,740	5.40	12,060	13.00	57,600
1.90	2,830	3.40	5,990	5.60	12,750	14.00	65,600
2.00	3,000	3.50	6,240	5.80	13,460	15.00	73,800
2.10	3,170	3.60	6,500	6.00	14,200	16.00	82,100
2.20	3,350	3.70	6,770	6.20	14,960	17.00	90,500
2.30	3,530	3.80	7,050	6.40	15,740	18.00	99,000
2.40	3,720						

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on 68 discharge measurements made during 1901-1908, and is well defined.

1909.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
2.20	3,790	3.80	7,440	5.40	12,310	7.80	21,990
2.30	3,970	3.90	7,710	5.50	12,650	8.00	22,950
2.40	4,160	4.00	7,980	5.60	13,000	8.20	23,940
2.50	4,350	4.10	8,260	5.70	13,350	8.40	24,960
2.60	4,550	4.20	8,540	5.80	13,710	8.60	26,010
2.70	4,760	4.30	8,830	5.90	14,070	8.80	27,080
2.80	4,970	4.40	9,120	6.00	14,440	9.00	28,180
2.90	5,190	4.50	9,420	6.20	15,190	10.00	33,850
3.00	5,420	4.60	9,720	6.40	15,970	11.00	39,850
3.10	5,650	4.70	10,030	6.60	16,770	12.00	46,050
3.20	5,890	4.80	10,340	6.80	17,590	13.00	52,400
3.30	6,140	4.90	10,660	7.00	18,420	14.00	58,900
3.40	6,390	5.00	10,980	7.20	19,270	15.00	65,500
3.50	6,650	5.10	11,310	7.40	20,150	16.00	72,200
3.60	6,910	5.20	11,640	7.60	21,060	17.00	79,000
3.70	7,170	5.30	11,970				

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on 14 discharge measurements made during 1909, and is well defined.

Daily discharge, in second-feet, of Penobscot River at West Enfield, 1901-1909.

Day.	Nov.	Dec.	Day.	Nov.	Dec.	Day.	Nov.	Dec.
1901.			1901.			1901.		
1	....	3,000	11	3,920	3,920	21	3,000	....
2	....	3,000	12	3,920	5,740	22	3,000	....
3	....	3,000	13	3,920	7,050	23	3,620	....
4	....	3,000	14	3,530	9,120	24	3,350	....
5	3,000	3,000	15	3,350	15,000	25	3,350	....
6	3,000	3,000	16	3,350	65,600	26	3,350	....
7	3,000	3,000	17	3,170	69,700	27	3,170	....
8	3,260	3,000	18	3,350	48,200	28	3,000	....
9	3,530	3,000	19	3,350	27,500	29	3,000	....
10	3,720	3,170	20	3,350	22,100	30	3,000	....
						31	....	....

Daily discharge, in second-feet, of Penobscot River at West Enfield, 1901–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.												
1	11,400	10,900	......	69,400	33,500	15,200	20,100	11,600	3,260	4,790	16,600	7,910
2	7,480	10,900	......	65,100	39,900	14,600	19,600	11,200	3,440	5,020	13,800	7,760
3	8,660	11,600	......	60,400	36,800	14,800	19,900	10,600	4,790	4,680	11,400	6,770
4	9,120	11,000	......	56,100	35,100	20,400	20,100	10,100	5,620	4,680	10,600	5,860
5	8,510	10,600	......	51,800	33,500	30,200	19,600	10,900	5,260	4,450	10,900	6,770
6	7,910	10,400	......	45,200	32,200	35,800	18,000	10,700	5,020	4,020	10,100	6,500
7	7,760	10,100	......	42,700	31,500	36,500	16,300	10,400	4,900	5,260	8,660	6,240
8	6,500	9,750	......	41,300	30,900	35,400	14,600	10,700	4,340	6,770	8,060	10,100
9	6,630	......	......	39,900	31,500	49,000	14,400	11,000	3,440	7,480	7,480	......
10	6,240	......	......	41,000	29,000	51,400	13,600	10,600	4,790	7,190	6,770	......
11	5,020	......	......	42,700	26,900	45,600	12,800	10,100	6,120	6,630	7,190	......
12	4,790	......	......	43,400	24,800	41,600	10,900	11,400	6,630	5,260	7,330	......
13	4,560	......	......	35,100	23,200	38,200	11,400	14,400	6,120	5,140	7,480	......
14	4,680	......	......	40,200	21,100	35,400	14,000	15,200	6,370	4,680	7,620	......
15	4,340	......	......	37,800	19,400	32,800	11,000	15,700	7,050	5,260	7,910	......
16	4,130	......	......	37,500	17,800	29,300	9,430	10,100	6,630	4,900	8,210	......
17	3,820	......	......	36,500	16,600	25,400	9,750	8,960	6,240	5,020	7,760	......
18	3,350	......	......	35,100	16,100	23,500	9,910	6,630	5,990	4,900	7,910	......
19	3,820	......	......	31,800	16,100	21,400	10,400	6,370	5,740	4,560	8,360	......
20	3,350	......	......	26,900	15,200	18,500	10,900	8,210	5.380	4,450	8,210	......
21	4,020	......	......	27,500	14,000	15,700	13,100	9,280	5,380	5,740	7,910	......
22	4,130	......	......	29,000	14,800	15,500	13,800	9,120	5,500	7,330	7,910	......
23	7,050	......	......	28,400	15,500	21,100	12,900	8,510	5,380	6,770	7,910	......
24	15,000	......	......	27,800	17,000	20,600	9,910	8,060	5,260	5,740	7,190	......
25	16,300	......	......	28,400	17,000	18,900	9,120	5,990	5,140	5,140	7,190	......
26	12,600	......	......	29,000	17,600	18,700	9,430	6,240	5,020	4,680	7,760	......
27	13,300	......	......	29,300	17,200	31,800	8,660	6,910	4,790	4,680	7,050	......
28	14,600	......	55,300	30,600	17,000	33,800	10,200	7,050	4,450	6,770	7,190	......
29	15,200	......	55,300	30,600	18,300	26,300	12,900	6,240	4,130	21,600	8,510	......
30	12,600	......	69,000	30,200	18.000	22,900	13,100	5,620	4,450	23,200	8,210	......
31	12,900	......	73,400	......	16,600	......	12,800	4,450	......	20,100	......	......
1903.												
1	......	......	......	43,400	24,600	6,500	5,620	8,660	5,380	2,500	2,060	2,660
2	......	......	......	41,600	22,100	7,330	5,740	7,480	5,500	2.350	2,200	2,500
3	......	......	......	40.600	19.900	6,770	5,740	6,770	5,260	2,200	2,280	2,350
4	......	......	......	41,600	19,900	5,990	5,500	6,120	5,620	2,280	2,130	2,430
5	......	......	......	45,600	20,100	5,380	5,860	5,860	4,900	2,200	2,060	2,500
6	......	......	......	43,400	18,900	5,380	6,630	5,620	4,340	2,060	1,930	2,500
7	......	......	......	41,000	18,500	4,560	5,620	5,500	5,020	2,130	1,930	2,350
8	......	......	......	41,000	17,000	4,130	6,120	5,260	5,140	2,130	2,130	2,350
9	......	......	......	45,600	17,600	4,020	7,190	5,380	4,790	1,930	2,500	2,430
10	......	......	......	50,200	17,600	5,260	8,960	5,500	5,020	1,930	2,350	2,500
11	......	......	......	48,200	17,200	5,140	9,590	5,620	4,450	1,810	2,350	2,500
12	......	......	93,400	43,800	17,400	5,500	7,910	6,910	4,130	2,060	2,580	2,740
13	......	......	60,000	40,600	17,000	6,630	6,630	6,500	4,340	2,200	3,350	3,720
14	......	......	58,400	38,200	16,800	9,910	6,120	5,990	4,130	2,200	4,020	3,920
15	......	......	48,200	36,500	14,600	12,600	7,050	6,240	4,230	2,200	4,130	......
16	......	......	49,000	34,800	13,800	8,360	6,500	6,500	4,560	2,350	4,130	......
17	......	......	44,100	33,100	13,100	7,910	8,210	6,370	4,230	2,280	3,920	......
18	......	......	41,000	30,900	12,600	7,330	8,210	6,370	4,230	2,350	3,820	......
19	......	......	37,500	29,900	11,900	7,190	7,050	6,630	4,020	2,430	3,440	......
20	......	......	41,600	29,000	10,700	6,770	7,480	7,480	3,920	2,500	3,170	......
21	......	......	45,200	26,600	10,100	6,370	7,050	8,360	4,130	2,430	3,000	......
22	......	......	46,100	24,800	9,910	5,500	6,500	8,510	6,120	2,350	2,830	......
23	......	......	48,600	24,000	9,430	4,560	6,630	6,770	5,500	2,430	2,660	......
24	......	......	52,900	24,000	8,510	5,380	6,500	5,740	3,620	2,500	2,660	......
25	......	......	61,600	23,500	7,760	5,620	6,910	5,990	4,020	2,660	2,500	......
26	......	......	60,800	24,000	7,760	5,260	6,770	5,740	3,350	2,500	2,660	......
27	......	......	57,600	24,600	7,620	5,380	6,500	5,500	2,830	2,350	2,660	......
28	......	......	53,300	24,000	7.620	5,620	5,740	5,260	2,920	2.200	2,660	......
29	......	......	48,200	24,600	7,190	5,740	6,630	5,500	3,000	2,200	2,500	......
30	......	......	44,500	24,600	6,770	5,380	8,210	5,380	2,580	2,060	2,660	......
31	......	......	43,400	......	6,120	......	10,400	5,260	......	......	......	......
1904.												
1	......	......	......	......	52,200	19,200	8,360	7,760	4,560	18,500	9,590	5,500
2	......	......	......	......	49,800	17,400	11,200	6,770	4,340	17,800	8,960	5,380
3	......	......	......	......	46,700	21,900	13,800	8,510	4,560	15,400	8,960	5.990
4	......	......	......	......	43,800	21,900	15,000	9,750	4,560	12,900	8,510	6,120
5	......	......	......	......	43,400	16,100	13,300	9,280	6,370	11,700	8,210	6,240

Daily discharge, in second-feet, of Penobscot River at West Enfield, 1901–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
6					39,900	17,800	12,200	8,810	6,770	10,900	7,910	6,240
7					43,100	19,200	11,000	8,060	6,630	9,910	8,060	6,120
8					29,600	20,900	9,750	7,760	5,860	9,590	9,120	6,770
9				27,200	25,700	18,000	8,960	8,060	5,500	9,280	8,810	7,190
10				33,100	25,700	16,600	8,660	7,910	5,500	8,660	8,510	8,360
11				40,600	36,100	16,100	10,700	8,210	5,260	8,210	8,210	8.360
12				43,800	46,700	15,700	8,660	8,510	5,020	8,060	7,910	8,060
13				42,400	48,200	15,000	8,360	8,210	5,140	7,910	7,760	
14				38,200	41,600	13,800	9,120	7,910	4,450	8,210	7,760	
15				34,400	37,200	12,400	9,910	7,620	5,140	8,210	7,480	
16				29,300	40,200	10,900	8,360	7,910	8,660	8,060	6,770	
17				24,800	48,600	10,400	7,190	7,480	10,100	8,060	6,500	
18				22,700	49,000	11,400	9,120	6,910	9,120	7,910	6,240	
19				22,100	46,300	13,600	7,050	6,240	8,060	7,760	6,500	
20				22,700	48,200	12,400	7,330	5,380	8,360	7,620	6,370	
21				22,100	49,800	11,200	7,760	6,120	7,910	7,330	6,370	
22				21,900	43,800	10,700	8,210	7,190	8,210	9,280	7,330	
23				22,700	39,600	10,600	6,240	6,370	7,910	13,500	7,190	
24				24,300	38,500	9,910	5.990	5,990	8,060	12,900	7,190	
25				26,600	34,800	9,280	6,630	5,740	9,910	11,600	7,050	
26				34,400	27.800	9.590	5.860	5,380	11.700	10,900	6,770	
27				36.500	23,500	10,400	7,050	4,900	11.000	12,200	6,630	
28				37,200	22,900	9,910	8,060	4,340	9,590	12.900	5,990	
29				37,800	21,100	8,060	6,120	4,560	10,200	12,200	5,740	
30				43,100	19,600	6,910	5,620	4,560	12,200	11,000	5,500	
31					19,900		5,740	4,450		9,750		
1905.												
1					16,800	14,800	4,130	7,050	5,140	3,530	1,930	
2					17,000	13,600	4,680	6,630	4,900	3,720	2,130	
3					16,600	12,200	6,370	6,240	5,140	3,720	2,740	
4					16,800	11,000	6,910	6,120	5,020	3,620	3,000	
5					16,600	10,400	7,620	6,630	5,140	3,260	2,660	
6					15,700	9,590	6,500	6,770	5,140	3,260	2,830	
7					15,000	10,400	5,620	5,260	4,560	2,920	2,920	
8					14,600	9,750	4,900	5,380	4,020	3,170	2,660	
9					15,400	8,660	4,450	5,740	3,720	3,000	2,920	
10					15,400	7,910	4,900	6,770	3,620	2,830	2,660	
11				33,800	15,000	7,620	5,500	6,120	3.530	3.000	2,500	
12				34,100	14,600	8,510	6,770	4,450	3,350	3,000	2,000	
13				33,800	15,900	9,120	5,500	4,020	3,820	3,170	2,430	
14				31,800	15,000	9,590	5,260	4,560	3,170	3,170	2.500	
15				30,600	14,400	9,590	4,900	4,230	3,440	3,350	2,000	
16				29,600	15.500	9,430	4,230	4,020	3,350	3,260	1,930	
17				28,400	15.700	9,430	5,860	4,900	3,260	3,000	2,830	
18				26,300	17,400	8,360	6,120	5,500	3,620	2,830	3,000	
19				23,200	20,100	7,480	5,500	5,500	3,920	2,830	3,170	
20				21,400	23,500	7,620	5,260	5,140	4,130	2,830	3,440	
21				21,100	22.400	7.190	5,020	5,260	4,130	2,430	3,080	
22				22.900	20,900	6,910	4,790	4,230	4,130	1,930	2,830	
23				23,700	19.900	6,630	4.790	3,820	3,820	2,350	2,660	
24				23,700	18,500	5,990	5,500	3.440	3,620	1,930	2.660	
25				22,400	18,700	5,620	5,380	3,080	4,230	1,870	2,200	
26				21,400	18,700	5,380	5,860	3,080	3,920	1,810	1,760	
27				19.900	18,500	5,860	5,500	3,820	3,920	1,930	2,500	
28				20,100	17,800	5,860	5,380	4,230	4,130	1,930	3,260	
29				18,700	17,000	5,140	5,620	4,340	4,230	1,630	2,660	
30				17,600	15,900	4,900	5,740	4,020	4,020	1,810	3,000	
31					14,600		6,120	4,560		1,930		
1906.												
1					45,600	21,400	8,360	9,120	6,120	3,170	12,200	
2					49,400	20,600	6,910	8,810	5,020	3,350	12,100	
3					52,400	20,400	9,280	8,360	4,900	3,350	13,600	
4					53,600	20,900	8,360	7,620	5,380	3,170	14,800	
5					52,800	19,600	9,120	7,330	5,990	3,000	14,000	
6					52,400	19,200	9,750	6,910	5,620	3,170	12,900	
7					51,700	21,600	8,360	6,630	5,260	3,170	12,100	
8					52,100	17,800	8,810	7,190	5,020	3,530	11,000	
9					50,500	17,400	11,200	7,480	4,450	3,530	10,700	
10					51,700	17,000	10,200	7,760	4,130	4,560	9,910	

Daily discharge, in second-feet, of Penobscot River at West Enfield, 1901–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
11	......	......	......	......	60,800	16,800	8,360	7,330	4,130	15,400	9,750	......
12	......	......	......	......	51,300	16,800	6,910	7,480	4,230	16,600	9,750	......
13	......	......	......	......	45,600	15,700	9,590	6,770	3,920	12,600	10,100	......
14	......	......	......	......	44,900	12,100	12,400	6,500	4,130	10,700	9,750	......
15	......	......	......	......	47,100	9,120	11,400	5,860	4,020	9,120	10,400	......
16	......	......	......	31,500	43,800	7,760	9,120	5,860	3,720	8,660	10,700	......
17	......	......	......	45,600	46,700	8,360	8,060	5,860	3,720	8,060	11,600	......
18	......	......	......	50,900	44,500	9,750	8,060	5,990	3,530	7,330	11,600	......
19	......	......	......	50,100	45,200	9,750	7,760	5,140	3,530	6,910	11,600	......
20	......	......	......	49,400	40,600	9,910	7,620	5,740	3,620	6,370	12,400	......
21	......	......	......	46,700	35,400	10,400	7,620	5,990	4,130	6,120	12,100	......
22	......	......	......	47,100	28,100	12,600	7,760	6,240	4,020	6,240	12,400	......
23	......	......	......	47,100	22,100	13,600	9,120	6,370	3,530	6,910	11,900	......
24	......	......	......	44,200	25,100	12,100	8,810	7,050	3,720	8,060	11,600	......
25	......	......	......	40,900	27,500	10,900	8,510	6,240	3,720	8,810	9,910	......
26	......	......	......	40,900	24,300	12,200	7,760	5,740	3,620	12,100	9,120	......
27	......	......	......	41,300	21,900	10,900	7,190	6,120	3,620	14,200	8,810	......
28	......	......	......	41,600	21,400	9,750	6,910	6,630	3,530	14,400	7,620	......
29	......	......	......	43,100	22,100	8,660	7,620	7,050	3,530	15,000	7,620	......
30	......	......	......	44,200	23,200	9,750	6,240	7,330	3,350	14,800	8,360	......
31	......	......	......	......	24,000	......	8,210	7,910	......	12,800	......	......
1907.												
1	......	......	......	......	87,100	26,300	28,400	13,100	6,120	8,210	14,600	16,300
2	......	......	......	......	91,400	25,100	30,900	13,600	5,740	7,910	13,800	15,400
3	......	......	......	......	84,200	23,200	31,800	14,600	5,990	7,910	16,800	14,600
4	......	......	......	......	70,900	21,900	28,100	12,800	6,370	8,810	19,900	14,600
5	......	......	......	......	64,300	20,900	25,700	11,900	7,760	9,590	20,400	13,800
6	......	......	......	......	57,200	21,100	25,700	14,800	11,200	8,810	18,300	11,900
7	......	......	......	......	51,000	27,500	21,400	18,300	11,900	8,360	20,400	8,960
8	......	......	......	......	47,400	26,300	19,200	18,700	10,400	8,960	43,800	8,360
9	......	......	......	......	44,900	25,700	18,700	16,600	9,120	16,800	42,000	7,910
10	......	......	......	......	41,300	26,600	18,500	13,600	8,660	18,300	36,800	9,750
11	......	......	......	......	35,400	24,300	17,600	12,100	7,480	15,900	34,100	25,100
12	......	......	......	......	31,800	20,600	16,300	11,000	7,760	12,900	31,500	39,600
13	......	......	......	......	29,600	17,800	15,500	10,900	8,360	11,700	29,600	31,800
14	......	......	......	......	28,100	16,100	15,000	10,600	7,620	11,400	27,500	24.600
15	......	......	......	......	27,200	15,200	14,800	10,100	6,910	11,000	26,000	19,400
16	......	......	......	......	27,800	14,400	15,900	9,750	6,500	11,000	23,700	21,100
17	......	......	......	......	27,500	13,800	15,900	9,590	6,240	10,600	21,900	21,600
18	......	......	......	......	30,600	14,000	13,800	9,430	6,240	9,590	20,400	21,400
19	......	......	......	......	33,800	13,600	12,200	9,280	5,990	7,910	19,400	19,900
20	......	......	......	......	36,500	13,100	11,200	9,120	5,740	6,770	18,700	16,100
21	......	......	......	......	33,100	12,800	11,200	8,810	6,120	6,240	18,300	13,800
22	......	......	......	......	29,900	11,900	12,400	8,210	5,620	6,120	17,600	12,900
23	......	......	......	26,300	26,900	10,400	12,100	7,480	5,380	6,910	17,200	11,900
24	......	......	......	36,500	25,100	10,900	12,400	8,510	6,370	6,630	17,000	16,300
25	......	......	......	51,800	25,100	13,600	12,600	7,760	8,960	7,330	16,300	17,000
26	......	......	......	56,900	23,500	17,400	13,800	7,480	10,100	7,480	17,200	17,600
27	......	......	......	60,000	22,400	19,400	15,500	7,620	9,750	8,060	17,800	17,800
28	......	......	......	63,100	26,000	30,600	16,100	7,330	8,360	8,360	17,800	16,300
29	......	......	......	74,200	28,100	31,200	14,800	7,050	7,190	8,660	17,400	13,300
30	......	......	......	80,000	29,900	29,900	13,600	6,910	7,480	16,600	17,000	12,200
31	......	......	......	......	27,800	......	13,500	6,630	......	17,400	......	11,000
1908.												
1	14,600	......	......	25,400	58,800	33,800	8,810	7,190	5,620	2,200	4,520	4,680
2	14,600	......	......	23,700	68,900	42,000	8,360	6,770	5,620	3,260	4,260	4,930
3	13,600	......	......	20,900	65,600	38,800	6,770	5,740	5,860	3,530	4,380	4,210
4	12,900	......	......	22,100	61,200	36,800	5,990	5,140	5,860	3,820	4,260	4,790
5	12,200	......	......	20,100	53,600	32,800	5,380	4,560	5,860	4,130	4,470	......
6	11,400	......	......	17,000	49,800	26,900	5,860	4,680	6,120	4,130	4,340	......
7	10,200	......	......	15,700	44,200	24,300	6,240	5,990	5,620	3,920	4,020	......
8	9,750	......	......	15,700	39,500	21,900	6,640	6,240	5,020	3,720	3,720	......
9	9,910	......	......	16,100	37,500	20,100	8,210	5,990	5,020	3,530	3,190	......
10	12,100	......	......	15,700	42,400	19,200	9,430	5,860	4,790	3,350	3,240	......
11	11,200	......	......	16,100	46,700	18,500	8,510	5,620	4,450	3,170	3,840	......
12	10,200	......	......	15,700	48,200	17,600	8,060	5,380	4,130	3,350	3,940	......
13	9,280	......	......	16,100	51,300	15,900	7,620	5,140	4,340	3,350	4,050	......
14	9,120	......	......	16,100	47,900	13,500	8,360	4,900	4,450	3,530	4,070	......
15	10,600	......	......	16,100	43,800	12,900	7,620	5,620	4,450	3,350	4,170	......

Daily discharge, in second-feet, of Penobscot River at West Enfield, 1901-1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
16	11,600	......	......	17,000	40,900	12,400	8,660	6,120	4,680	3,530	3,660	......
17	12,400	......	......	18,300	40,900	12,200	8,960	6,770	4,340	3,530	3,820	......
18	13,600	......	......	17,800	41,600	12,100	9,280	6,910	4,130	3,350	4,260	......
19	13,600	......	......	17,200	39,500	11,600	9,120	7,480	3,820	3,260	4,260	......
20	......	......	......	16,300	36,800	10,700	9,430	7,760	3,920	3,350	4,360	......
21	......	......	......	16,100	32,800	11,000	10,400	7,050	3,720	3,350	4,210	......
22	......	......	......	15,700	27,800	11,400	9,280	6,910	3,530	3,170	8,680	......
23	......	......	......	16,300	26,000	11,600	8,660	6,240	3,350	3,170	3,050	......
24	......	......	......	19,400	24,600	10,600	8,060	5,620	3,350	2,920	3,620	......
25	......	......	......	23,700	22,700	10,100	7,620	5,990	3,530	2,280	3,720	......
26	......	......	......	26,600	21,100	10,400	7,190	5,860	3,260	2,060	3,660	......
27	......	......	......	33,800	21,600	9,910	7,050	5,860	2,130	2,830	4,280	......
28	......	......	27,800	47,500	22,100	8,810	7,620	5,860	1,670	4,000	4,880	......
29	......	......	28,400	60,000	21,100	8,060	7,330	5,740	1,870	4,740	4,700	......
30	......	......	28,100	59,600	20,600	8,960	7,050	5,500	2,200	4,430	4,490	......
31	......	......	25,700	......	22,400	......	7,190	5,500	......	4,520	......	......
1909.												
1	......	......	......	......	37,800	20,600	9,570	6,140	4,970	51,500	7,950	15,600
2	......	......	......	......	36,800	19,500	9,880	6,020	5,190	40,200	7,930	14,400
3	......	......	......	......	36,600	18,000	9,420	5,890	5,770	34,200	8,430	14,000
4	......	......	......	......	36,600	17,000	9,120	5,770	5,890	29,300	11,700	13,600
5	......	......	......	......	39,000	15,600	8,980	5,650	6,140	25,000	13,600	13,500
6	......	......	......	......	39,000	13,400	8,830	4,970	6,140	23,800	13,300	13,400
7	......	......	......	......	39,200	13,000	8,830	4,350	7,440	21,200	13,200	13,600
8	......	......	......	......	39,800	14,100	9,120	3,970	7,040	19,600	11,600	13,100
9	......	......	......	......	41,100	16,000	9,420	3,790	6,650	17,100	11,300	12,500
10	......	......	......	......	44,200	15,000	10,000	4,060	6,390	14,800	11,300	13,500
11	......	......	......	......	48,000	14,100	9,270	4,260	6,910	13,400	10,800	8,830
12	......	......	......	......	48,600	13,000	8,680	4,450	6,960	12,500	10,200	7,980
13	......	......	......	......	45,700	11,800	8,400	4,760	7,170	11,400	9,360	6,910
14	......	......	......	......	43,600	9,880	7,980	4,450	7,170	10,300	9,240	8,400
15	......	......	......	......	43,000	9,270	7,710	4,260	7,170	10,000	9,120	9,180
16	......	......	......	......	45,700	8,680	8,260	4,160	7,120	10,000	9,060	9,270
17	......	......	......	62,000	48,300	8,980	8,540	3,970	7,120	9,880	8,890	9,120
18	......	......	......	57,100	45,700	11,800	7,840	4,350	6,910	9,880	9,060	9,360
19	......	......	......	55,000	46,000	18,200	7,440	4,760	6,700	9,270	9,120	8,680
20	......	......	......	57,100	44,800	17,000	8,540	5,080	6,340	8,770	8,770	7,980
21	......	......	......	56,700	42,600	13,500	8,540	5,300	5,540	8,570	8,400	7,580
22	......	......	......	56,500	39,000	12,300	8,260	5,540	4,510	8,540	8,040	7,490
23	......	......	......	55.300	36,600	12,000	8,680	5,300	4,350	8,370	8,260	7,440
24	......	......	......	56.500	34,800	11,600	8,540	5,650	4,160	8,320	8,660	7,220
25	......	......	......	55,000	35,000	10,700	7,980	5,890	4,160	8,770	9,060	6,650
26	......	......	......	48,900	32,700	10,200	7,840	6,390	4,160	9,910	11,300	6,600
27	......	......	......	46,000	28,700	9,720	8,540	6,910	4,550	10,000	23,500	7,040
28	......	......	......	43,900	27,100	9,120	8,980	6,390	16,400	9,840	22,200	6,190
29	......	......	......	43,600	26,300	8,980	7,710	5,650	61,200	9,150	20,500	5,800
30	......	......	......	42,300	25,700	9,720	6,780	5,300	76,300	8,600	17,600	5,500
31	......	......	......	......	21,500	......	6,520	5,080	......	8,320	......	5,200

Monthly discharge of Penobscot River at West Enfield, 1901–1909.

[Drainage area, 6,600 square miles.[a]]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1901.						
Nov. 5–30	3,920	3,000	3,100	0.470	0.45	B.
Dec. 1–20	69,007	3,000	15,200	2.30	1.71	B.
1902.						
January	16,300	3,350	8,060	1.22	1.41	B.
Feb. 1–8	11,600	9,750	10,700	1.62	.48	C.
Mar. 28–31	73,400	55,300	63,200	9.58	1.43	C.
April	69,400	26,900	39,000	5.91	6.59	A.
May	39,900	14,000	22,900	3.47	4.00	A.
June	51,400	14,600	28,000	4.24	4.73	A.
July	20,100	8,660	13,300	2.02	2.33	A.
August	15,700	4,450	9,430	1.43	1.65	A.
September	7,050	3,260	5,220	.791	.88	A.
October	23,200	4,020	7,000	1.06	1.22	A.
November	16,600	6,770	8,640	1.31	1.46	A.
Dec. 1–8	10,100	5,860	7,240	1.10	.33	B.
1903.						
Mar. 12–31	93,400	37,500	51,800	7.85	5.84	B.
April	50,200	23,500	34,800	5.27	5.88	A.
May	24,600	6,120	13,900	2.11	2.43	A.
June	12,600	4,020	6,250	.947	1.06	A.
July	10,400	5,500	6,950	1.05	1.21	A.
August	8,660	5,260	6,280	.952	1.10	A.
September	6,120	2,580	4,380	.664	.74	A.
October	2,660	1,810	2,260	.340	.39	A.
November	4,130	1,930	2,780	.421	.47	A.
Dec. 1–14	3,920	2,350	2,680	.406	.21	A.
1904.						
Apr. 9–30	43,800	21,900	31,300	4.74	3.88	B.
May	52,200	19,600	38,200	5.79	6.68	A.
June	21,900	6,910	13,900	2.11	2.35	A.
July	15,000	5,620	8,750	1.33	1.53	A.
August	9,750	4,340	6,990	1.06	1.22	A.
September	12,200	4,340	7,360	1.12	1.25	A.
October	18,500	7,330	10,600	1.61	1.86	A.
November	9,590	5,500	7,460	1.13	1.26	A.
Dec. 1–12	8,360	5,380	6,690	1.01	.45	B.
1905.						
Apr. 11–30	34,100	17,600	25,200	3.82	2.84	B.
May	23,500	14,400	17,100	2.59	2.99	A.
June	14,800	4,900	8,480	1.28	1.43	A.
July	7,620	4,130	5,510	.835	.96	A.
August	7,050	3,080	5,000	.758	.87	A.
September	5,140	3,170	4,070	.617	.69	A.
October	3,720	1,630	2,740	.415	.48	A.
November	3,440	1,760	2,630	.398	.44	A.
1906.						
Apr. 16–30	50,900	31,500	44,300	6.71	3.74	A.
May	60,800	21,400	40,600	6.15	7.09	A.
June	21,600	7,760	14,100	2.14	2.39	A.
July	12,400	6,240	8,560	1.30	1.50	A.
August	9,120	5,140	6,850	1.04	1.20	A.
September	6,120	3,350	4,240	.643	.72	B.
October	16,600	3,000	8,230	1.25	1.44	B.
November	14,800	7,620	11,000	1.67	1.86	A.

[a] Includes Chamberlain Lake basin, 270 square miles.

Monthly discharge of Penobscot River at West Enfield, 1901–1909—Continued.

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1907.						
January			6,820	1.03	1.19	C.
February			3,960	.600	.62	C.
March			2,930	.444	.51	C.
April	80,000		17,600	2.67	2.98	A.
May	91,400	22,400	40,200	6.10	7.03	A.
June	31,200	10,400	19,900	3.02	3.37	A.
July	31,800	11,200	17,600	2.67	3.08	A.
August	18,700	6,630	10,800	1.64	1.89	A.
September	11,900	5,380	7,580	1.15	1.28	A.
October	18,300	6,120	10,100	1.53	1.76	A.
November	43,800	13,800	22,400	3.39	3.78	A.
December	39,600	7,910	16,800	2.55	2.94	A.
The year	91,400		14,700	2.23	30.43	
1908.						
January	14,600		11,300	1.71	1.97	C.
February			10,400	1.58	1.70	C.
March	28,400		11,200	1.70	1.96	C.
April	60,000	15,700	22,600	3.42	3.82	A.
May	68,900	20,600	39,400	5.97	6.88	A.
June	42,000	8,060	17,800	2.70	3.01	A.
July	10,400	5,380	7,900	1.20	1.38	A.
August	7,760	4,560	6,000	.909	1.05	A.
September	6,120	1,670	4,220	.639	.71	B.
October	4,740	2,060	3,450	.523	.60	B.
November	4,880	3,060	4,040	.612	.68	B.
December			3,960	.600	.69	C.
The year	68,900		11,900	1.80	24.45	
1909.						
January			4,740	0.718	0.83	C.
February			3,290	.498	.52	C.
March			7,290	1.10	1.27	C.
April	62,000		37,000	5.61	6.26	B.
May	48,600	21,500	38,700	5.86	6.76	A.
June	20,600	8,680	13,100	1.98	2.21	A.
July	10,000	6,520	8,520	1.29	1.49	A.
August	6,910	3,790	5,110	.774	.89	A.
September	76,300	4,160	10,600	1.61	1.80	A.
October	51,500	8,320	15,500	2.35	2.71	A.
November	23,500	7,930	11,400	1.73	1.93	A.
December	15,600		9,540	1.45	1.67	B.
The year	76,300	3,790	13,700	2.08	28.34	

NOTE.—Estimates of discharge during winter periods 1907–8 taken as the sum of the four stations above West Enfield, viz: Millinocket, Grindstone, Mattawamkeag, and Foxcroft, plus an inflow below these four stations and above West Enfield. The rate of inflow per square mile was assumed to be about equivalent to the average rate of Foxcroft and Mattawamkeag for the period in question.

NOTE.—Discharge for the frozen periods based on studies of climatologic data and comparisons with other stations.

Mean discharge Apr. 1–16 estimated 23,300 second-feet.

PENOBSCOT RIVER AT SUNKHAZE RIPS, NEAR COSTIGAN.

A record of the flow at Sunkhaze Rips, near Costigan, Me., was kept from September 15, 1899, to September 22, 1900. The rating curve was constructed from tube-float measurements made by George F. Hardy and reported to the Supreme Court of Maine on October 23, 1901. The drainage basin at Sunkhaze Rips has an area of 7,260 square miles. The results of the measurements at this point are given in the following table:

Daily discharge, in second-feet, of Penobscot River at Sunkhaze Rips, near Costigan, 1899–1900.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1899.					1899.				
1	....	3,450	3,300	4,800	16	2,640	2,330	6,100	10,000
2	....	4,250	5,600	5,100	17	2,600	2,410	5,800	9,750
3	....	5,100	10,800	5,950	18	2,350	2,330	4,400	10,200
4	....	3,900	12,200	8,000	19	2,900	2,330	5,100	10,200
5	....	3,550	11,000	8,750	20	2,380	2,390	5,250	10,500
6	....	3,360	10,800	8,650	21	2,450	2,430	5,950	11,000
7	....	3,190	10,500	8,650	22	2,750	2,350	6,240	11,200
8	....	3,300	14,000	7,700	23	2,670	2,100	6,700	11,200
9	....	3,200	9,090	8,500	24	2,850	2,670	6,800	10,300
10	....	3,100	8,300	7,900	25	2,450	2,420	6,450	9,850
11	....	3,100	7,620	7,440	26	[a]3,410	2,320	5,600	9,750
12	....	2,950	7,300	7,230	27	[a]3,300	2,100	5,100	9,200
13	....	2,750	6,020	9,400	28	3,140	2,330	5,250	8,850
14	....	2,630	6,240	11,500	29	3,020	2,160	5,600	8,570
15	2,830	2,630	6,100	11,500	30	3,190	[a]2,000	5,800	8,400
					31	....	2,550	....	9,430

[a] Shut down at Montague.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.
1900.									
1	9,500	36,000	47,600	40,300	59,400	34,300	11,900	14,100	5,950
2	10,000	35,800	47,500	39,600	54,800	30,300	12,200	13,600	5,950
3	10,500	33,700	45,600	41,300	54,100	36,300	11,900	12,900	5,950
4	11,700	32,200	44,400	44,500	61,200	41,600	11,300	12,700	5,950
5	11,900	31,700	42,300	46,600	72,500	38,200	11,700	12,400	6,100
6	11,200	31,800	41,400	43,800	74,700	34,700	12,500	12,400	6,950
7	11,000	31,500	39,400	42,600	69,900	32,300	12,800	12,000	6,800
8	10,000	31,000	37,700	45,300	66,900	30,300	12,800	12,000	6,250
9	10,200	30,000	36,500	48,800	63,600	27,400	13,200	12,000	5,800
10	10,200	29,200	35,100	44,500	63,000	24,200	14,100	12,000	5,400
11	10,200	27,200	33,600	48,800	61,700	24,200	14,100	12,000	3,140
12	12,600	26,200	32,600	36,600	58,000	23,900	14,100	13,400	3,270
13	13,600	27,200	31,100	38,000	53,400	22,300	14,400	13,200	3,100
14	13,200	29,800	30,500	42,600	49,400	22,000	13,900	12,700	3,270
15	12,800	43,000	29,800	44,500	50,100	18,400	14,600	12,400	3,350
16	12,200	51,000	29,200	46,100	54,100	19,000	14,000	13,400	3,250
17	12,000	52,400	34,800	48,100	50,700	17,500	11,900	12,400	3,050
18	12,400	49,900	44,100	49,400	50,800	14,600	13,200	12,000	3,020
19	12,200	47,300	33,200	54,800	48,800	13,600	16,900	11,900	2,800
20	11,800	45,000	32,500	62,400	54,100	12,600	21,400	11,700	2,620
21	11,800	43,000	62,700	62,000	62,400	10,500	18,700	11,200	2,880
22	12,600	39,700	62,500	75,100	55,700	9,700	14,400	10,400	....
23	13,600	38,300	61,300	74,700	61,700	12,200	12,900	9,000	....
24	14,800	35,700	59,500	71,400	60,000	10,200	11,300	7,650	....
25	15,600	34,800	58,000	69,600	57,800	9,400	11,300	6,350	....
26	16,300	38,300	55,500	67,500	55,000	8,300	12,200	4,850	....
27	19,000	44,400	54,800	65,300	50,800	8,150	15,100	6,600	....
28	27,500	47,300	57,500	61,700	49,800	7,800	15,100	6,450	....
29	32,000	....	48,100	59,500	47,100	9,000	14,800	6,150	....
30	33,500	....	44,500	56,800	44,200	10,200	14,600	5,950	....
31	35,400	....	41,300	....	39,900	....	13,600	6,200	....

Monthly discharge of Penobscot River at Sunkhaze Rips, near Costigan, 1899–1900.

[Drainage area, 7,260 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1899.					
Sept. 15–30	3,410	2,350	2,810	0.387	0.23
October	5,100	2,000	2,760	.380	.44
November	14,000	3,300	7,170	.988	1.10
December	11,500	4,800	9,020	1.24	1.43
1900.					
January	35,400	9,500	14,900	2.05	2.36
February	52,400	26,200	37,300	5.14	5.35
March	62,700	29,200	43,800	6.03	6.95
April	75,100	36,600	52,400	7.22	8.06
May	74,700	39,900	56,600	7.80	8.99
June	41,600	7,800	20,400	2.81	3.14
July	21,400	11,300	13,800	1.90	2.19
August	14,100	4,850	10,700	1.47	1.70
Sept. 1–21	6,950	2,620	4,520	.623	.49

EAST BRANCH OF PENOBSCOT RIVER AT GRINDSTONE.

The East Branch of the Penobscot originally had its headwaters in Webster and East Branch streams in the north-central part of the State. Prior to 1845 a canal was cut from Telos Lake, in the Allagash basin, to Webster Lake, in the Penobscot basin, and a dam was constructed between Chamberlain and Eagle lakes. Thus, by means of these artificial structures, Chamberlain Lake, with its drainage basin of 270 square miles, was made tributary to the Penobscot. This diversion of St. John water is still continued. During the log-driving season nearly all of the run-off from this area is thrown to the Penobscot, and during the remainder of the year the gates in the dam at Chamberlain Lake are opened and water is allowed to flow both ways. On account of the fact that the gates in the dam at the outlet of Chamberlain Lake are about 2 feet lower than those in the dam at Telos Lake, the flow from this basin to the St. John is greater than that to the Penobscot when the gates in both are open. As the surface of the lake is lowered the proportion flowing to the St. John increases until at extreme low water none flows to the Penobscot. The basin of the East Branch, which, including the 270 square miles of the St. John area, comprises an area of 1,100 square miles, is completely forested and largely wild, has much undeveloped water power, and affords excellent opportunities for water storage.

The gaging station was established October 23, 1902, at the Bangor & Aroostook Railroad bridge, one-half mile south of the railroad station at Grindstone. It is about 8 miles above the junction of the East Branch with the Penobscot at Medway. No water power is used on the river above the station, but dams are maintained at the outlet of several of the lakes and ponds near the source of the river, and the impounded water is used for log driving.

The datum of the gage has remained the same during the maintenance of the station. The discharge is affected by ice during the winter months, and in the log-driving season jams at the station and at Grindstone Falls immediately below are liable to materially vitiate the published estimates of discharge.

Conditions for obtaining accurate discharge data are good except at low stages, when the current becomes very sluggish. A good rating curve has been developed, although more measurements are required at extreme low and extreme high stages.

Discharge measurements of East Branch of Penobscot River at Grindstone, 1902–1906 and 1908–9.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
1902.	*Feet.*	*Second-feet.*	1905.	*Feet.*	*Second-feet.*
Oct. 23	5 15	706	Apr. 14	7.45	4,080
Nov. 26	5.41	921	Oct. 17	3.96	122
1903.			1908.		
Apr. 9	7.85	4,670	Feb. 21[b]	6.83	1,340
Apr. 14	8.10	5,350	Apr. 23	6.16	1,950
Apr. 22	7.20	3,230	Oct. 5	4.56	393
May 23	6.64	2,580	Oct. 31	4.69	433
Sept. 9	4.32	223	Dec. 2	5.13	733
Sept. 26	5.36	824			
Oct. 28[a]	4.58	474	1909.		
			Apr. 29[c]	8.72	5,530
1904.			Oct. 27	6.06	1,770
Apr. 29	9.13	8,180			
Oct. 24	6.32	2,230			

[a] Measurement made from boat.
[b] Gage height to top of ice, 6.83. Average thickness of ice, 1.6 feet.
[c] Jam of logs on pier.

Daily gage height, in feet, of East Branch of Penobscot River, at Grindstone, 1902–1909.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1902.				1902.				1902.			
1	......	6.15	5.50	11	......	5.60	5.30	21	......	5.55	......
2	......	6.05	5.50	12	......	5.65	5.30	22	......	5.60	......
3	......	5.90	5.40	13	......	5.80	5.30	23	5.15	5.60	......
4	......	5.90	5.20	14	......	5.55	(a)	24	5.10	5.60	......
5	......	5.90	5.20	15	......	5.50	......	25	5.10	5.55	......
6	......	5.80	5.30	16	......	5.50	......	26	5.10	5.50	......
7	......	5.80	5.30	17	......	5.70	......	27	5.10	5.60	......
8	......	5.70	5.30	18	......	5.60	......	28	5.50	5.70	......
9	......	5.65	5.30	19	......	5.55	......	29	7.65	5.55	......
10	......	5.70	5.30	20	......	5.50	......	30	7.05	5.50	......
								31	6.45	......	......

(a) Frozen from Dec. 14 to 31.

Daily gage height, in feet, of East Branch of Penobscot River at Grindstone, 1902–1909—Con.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.										
1		7.85	8.20	5.70	5.00	7.60	4.50	4.80	4.50	
2		7.55	8.05	5.65	5.00	7.40	4.50	4.65	4.50	
3		7.60	7.85	5.70	5.00	7.45	4.50	4.50	4.50	
4		8.25	7.70	5.65	5.00	7.40	4.50	4.50	4.50	3.70
5		8.30	7.15	5.60	5.00	7.25	4.50	4.50	4.55	
6		7.90	6.70	5.60	5.05	7.10	4.50	4.50	4.75	
7		7.65	6.45	5.60	6.20	7.10	4.40	4.40	4.80	3.70
8		7.50	6.75	5.50	6.50	7.10	4.30	4.25	4.80	
9		7.90	7.45	5.50	6.35	7.15	4.30	4.10	4.80	
10		8.40	7.20	5.50	6.70	7.05	4.30	4.10	4.80	
11		8.40	7.20	4.90	7.40	6.70	4.30	4.10	4.90	
12		8.30	7.10	5.40	6.25	6.15	4.30	4.10	5.10	
13		8.20	7.20	6.00	5.40	6.00	4.30	4.40	5.45	3.90
14		8.10	7.50	6.80	5.40	5.85	4.40	4.40	5.40	
15		8.10	8.10	6.20	5.90	5.70	4.40	4.30	5.25	
16		8.30	8.20	5.60	7.40	5.55	4.40	4.30	5.20	
17		8.20	8.35	5.40	7.90	4.90	4.50	4.20	5.10	
18		7.55	8.40	5.25	7.85	4.70	4.50	4.50	5.10	
19		7.30	8.20	5.40	7.80	4.60	4.50	4.90	4.95	
20		7.00	7.10	5.30	7.90	4.90	6.20	4.75	4.75	4.0
21		6.90	7.10	5.30	7.90	5.70	6.20	4.55	4.60	
22		7.00	6.85	5.30	7.80	5.25	6.10	4.50	4.60	
23		7.15	6.60	5.30	7.45	5.05	5.95	4.50	4.45	
24	(a)	7.10	5.90	5.30	6.30	4.80	5.80	4.50	4.35	
25	10.00	7.30	5.40	5.30	6.05	4.70	5.60	4.50	4.30	
26	10.00	7.50	5.20	5.20	6.15	4.60	5.45	4.50	4.30	
27	9.85	7.80	5.20	5.10	7.20	4.70	5.20	4.50	4.20	4.30
28	9.30	7.90	5.30	5.10	7.70	4.50	5.05	4.50	4.15	
29	8.70	8.05	5.10	5.00	7.70	4.50	4.90	4.50	(b)	
30	8.40	8.20	5.10	5.00	7.70	4.50	4.80	4.50		
31	8.25		5.10		7.60	4.50		4.50		

[a] Frozen Jan. 1 to Mar. 24.

[b] Readings Nov. 29 to Dec. 31 through ice.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
1					10.30	8.70	6.10	7.00	4.60	7.15	5.60	
2					10.80	8.60	6.30	6.80	4.60	7.30	5.60	
3	4.20				10.25	8.20	6.60	6.60	4.70	7.30	5.60	4.30
4				4.80	9.60	7.25	6.80	6.60	5.40	6.90	5.30	
5					9.60	7.35	6.80	6.70	5.60	6.55	5.30	
6			3.40		9.40	8.20	6.40	6.80	5.40	6.30	5.30	
7		3.30			8.40	7.90	6.20	6.95	5.05	6.10	5.30	
8					7.65	7.90	6.20	7.00	5.00	6.05	5.30	
9					7.30	8.05	6.20	7.00	5.00	5.90	5.30	
10	3.50			6.50	7.75	8.20	6.20	7.00	4.80	5.80	5.30	4.10
11					8.30	8.20	6.20	7.00	4.70	5.80	5.20	
12					9.05	8.20	6.20	6.80	4.70	5.85	5.20	
13			3.40		9.50	8.05	6.20	6.80	4.70	5.60	5.30	
14		3.30			8.65	8.05	6.05	5.40	4.70	5.60	5.30	
15					8.60	6.30	5.65	5.80	5.10	5.60	5.30	
16					7.30	6.40	5.60	5.80	6.20	5.60	5.30	
17	3.50			6.50	8.70	6.50	6.10	5.55	5.25	5.60	5.30	
18				6.50	8.15	6.60	6.40	5.45	5.60	5.50	5.30	8.00
19				6.50	8.40	6.15	6.55	5.25	5.65	5.50	5.30	
20			3.60	6.50	8.75	5.30	6.60	5.20	5.70	5.40	5.30	
21		3.30		6.70	9.00	5.50	6.80	5.50	5.55	5.40	5.30	
22				7.00	7.65	5.40	6.80	5.30	5.35	6.90	5.30	
23				7.20	7.95	5.10	6.95	5.30	5.30	7.15	5.30	
24	3.50			7.20	7.90	5.10	7.20	5.40	5.30	6.35	5.30	
25				7.75	7.45	5.10	7.20	5.20	5.80	6.30	5.30	8.00

Daily gage height, in feet, of East Branch of Penobscot River at Grindstone, 1902-1909—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
26				8.30	7.20	5.20	7.20	5.20	6.05	6.20	5.30	
27			4.40	9.00	7.90	5.20	7.20	5.20	6.10	6.10		
28		3.20		9.20	8.70	5.20	7.20	4.90	6.10	6.00		
29				9.20	8.90	5.20	7.20	4.85	6.55	6.00	5.30	
30				9.90	8.70	5.90	7.20	4.70	6.90	5.75		
31	3.50				8.70		7.10	4.60		5.60		3.80

NOTE.—River frozen Jan. 1 to Apr. 16 and Nov. 26 to Dec. 31. During frozen season readings are to surface of water in hole cut in ice.

The following measurements of the thickness of the ice were made:

	Feet.		Feet.
Jan. 10	1.15	Apr. 4	1.35
Jan. 17, 24, 31	1.35	Nov. 29	.85
Feb. 7, 14, 21	1.7	Dec. 3	.85
Feb. 28	1.85	Dec. 10	1.0
Mar. 6	2.15	Dec. 18	1.15
Mar. 13	2.1	Dec. 25	1.4
Mar. 20	2.0	Dec. 31	1.6
Mar. 27	1.85		

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1					7.35	6.25	5.35	5.4	7.3	4.2	4.5	5.2
2				7.15	7.25	5.95	5.4	5.05	7.3	4.15	4.5	
3					7.1	6.05	5.55	4.9	7.3	4.1	4.5	
4			5.55		6.95	6.45	5.55	4.75	7.05	4.1	4.5	
5					6.4	7.15	5.55	4.7	6.25	4.1	4.4	
6		5.55			5.85	7.35	5.6	4.8	6.1	4.1	4.4	
7	5.65			8.95	5.95	7.05	5.35	4.9	5.85	4.1	4.4	
8				8.55	5.9	7.05	5.3	4.9	5.3	4.1	4.4	
9				8.4	5.85	7.05	5.35	4.9	5.15	4.4	4.4	4.4
10				7.85	5.85	7.15	5.4	4.65	4.8	4.3	4.4	
11			5.55	7.45	5.85	7.1	6.35	4.6	4.6	4.1	4.4	
12		5.55		7.45	5.85	7.05	6.15	4.5	4.4	4.1	4.5	
13				7.45	5.85	7.05	6.05	4.5	4.2	4.1	4.7	
14				7.2	6.1	7.05	6.0	4.5	4.2	4.1	4.7	
15				6.95	6.2	7.05	5.9	4.5	4.4	4.1	4.7	
16	5.65			6.95	6.35	7.05	5.9	4.5	4.4	4.1	4.7	4.4
17				6.7	6.5	6.8	5.9	4.5	4.5	4.2	4.7	
18		5.55	5.25	6.25	7.0	6.25	6.15	4.5	4.5	4.3	4.7	
19				6.15	7.4	5.35	6.7	4.5	4.5	4.3		
20				6.15	7.55	5.4	6.9	4.5	4.5	4.3		
21	5.55			6.85	7.5	5.15	6.9	4.5	4.5	4.3		
22				7.25	7.25	5.05	6.9	4.5	4.5	4.3		
23				7.75	7.25	5.05	6.85	4.4	4.3	4.3	4.9	
24				7.85	7.25	5.05	6.8	4.4	4.2	4.3		
25				7.9	7.45	5.1	7.0	4.4	4.2	4.05		
26		5.55	5.55	7.35	7.55	5.25	7.35	5.85	4.2	3.9		4.4
27				7.0	7.55	5.25	7.4	6.2	4.2	3.9		
28				7.05	7.25	5.3	7.4	6.35	4.2	3.9		
29				7.05	7.15	5.35	7.4	6.8	4.2	3.8		
30	5.6			7.15	6.6	5.35	7.4	6.9	4.2	3.8		4.4
31					6.85		7.4	7.1		3.8		

NOTE.—River frozen Jan. 1 to Apr. 7 and Nov. 19 to Dec. 31. During frozen period gage heights were read to the surface of the ice.

The following measurements of the thickness of the ice were made:

	Feet.		Feet.
Jan. 7	1.8	Mar. 18	2.3
Jan. 16	2.0	Mar. 26	1.8
Jan. 21	2.0	Apr. 2	1.0
Jan. 30	2.0	Nov. 23	.2
Feb. 6	2.3	Dec. 1	.5
Feb. 12	2.3	Dec. 9	.5
Feb. 18	2.3	Dec. 16	.7
Feb. 26	2.4	Dec. 26	.7
Mar. 4	2.4	Dec. 30	.7
Mar. 11	2.4		

Daily gage height, in feet, of East Branch of Penobscot River at Grindstone, 1902-1909—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
1					9.4	7.1	4.85	4.6	6.0	4.9	4.75	5.3
2		5.4			9.6	7.2	5.45	4.5	5.9	4.9	4.9	5.3
3			5.6		9.7	7.9	6.2	4.6	5.7	4.8	5.05	5.2
4					9.8	7.1	6.85	4.5	5.6	4.8	5.2	5.15
5		5.1			9.85	8.4	6.65	4.5	5.45	4.7	5.35	5.1
6	4.5		5.15	6.3	9.9	8.25	6.7	4.4	5.3	4.6	5.45	5.0
7					10.25	8.65	7.85	4.35	5.15	4.6	5.7	4.95
8					10.4	8.7	7.8	4.35	5.1	4.7	5.8	4.9
9					9.9	8.65	7.85	4.2	5.0	4.7	5.9	4.85
10		5.1			9.6	8.65	7.5	4.25	4.9	5.05	6.3	4.85
11					9.3	8.7	7.45	4.3	4.9	5.85	6.25	4.8
12				5.7	9.3	8.65	7.4	4.4	4.8	6.4	6.1	4.8
13			5.2		9.3	7.35	7.7	4.4	4.8	6.8	6.0	4.7
14					9.3	7.75	7.85	4.4	4.7	6.7	6.0	4.7
15					9.0	7.25	7.65	4.35	4.7	6.5	5.95	4.7
16	4.5			8.3	9.0	6.85	7.65	4.3	4.7	6.4	5.9	4.6
17					9.0	6.55	7.6	4.25	4.7	6.15	5.9	4.5
18			5.2	8.7	8.8	7.8	7.5	4.2	4.8	6.1	5.85	4.5
19					8.7	6.55	7.3	4.2	4.85	5.8	5.9	4.45
20		5.0			8.6	6.45	7.35	4.1	4.9	5.55	5.95	4.4
21				8.7	8.55	6.4	7.35	4.1	5.0	5.45	6.15	4.4
22	5.0			8.7	9.3	6.5	7.1	4.2	5.1	5.4	6.25	4.4
23				8.7	9.0	5.6	7.3	4.2	5.1	5.2	6.2	4.4
24				7.8	8.7	5.85	6.9	4.2	5.1	5.15	6.1	4.4
25			6.3	8.05	8.9	5.75	6.55	4.2	5.05	5.1	5.9	4.4
26				8.4	8.75	5.45	6.4	4.5	5.0	5.0	5.85	4.4
27				8.7	8.8	5.25	6.2	4.65	5.0	5.05	5.75	4.3
28				8.9	8.4	5.4	6.15	4.9	4.95	5.15	5.7	4.3
29				9.1	8.35	4.85	5.75	5.3	4.9	5.05	5.6	4.3
30				9.35	7.3	4.85	5.25	5.45	4.8	4.9	5.5	4.3
31					7.2		4.85	5.75		4.8		4.3

NOTE.—River frozen Jan. 1 to Apr. 21 and Nov. 25 to Dec. 31, 1906, inclusive. During the frozen period gage heights were taken to water surface through a hole in the ice. The following comparative readings were taken:

Date.	Water surface.	Top of ice.	Thickness of ice.	Date.	Water surface.	Top of ice.	Thickness of ice.
	Feet.	*Feet.*	*Feet.*		*Feet.*	*Feet.*	*Feet.*
Jan. 6	4.5	4.5	0.8	Mar. 25	6.3	6.3	2.0
Jan. 16	4.5	4.5	.9	Apr. 6	6.3	6.3	1.8
Jan. 22	5.0	5.0	.9	Apr. 12	5.7	5.7	1.4
Feb. 2	5.4	5.4	.9	Apr. 16	8.3	8.3	1.2
Feb. 5	5.1	5.1	1.2	Nov. 25	5.85		.1
Feb. 10	5.1	5.1	1.4	Dec. 2	5.3		.2
Feb. 20	5.0	5.0	1.8	Dec. 9	4.85		.3
Mar. 3	5.6	5.6	2.1	Dec. 16	4.6		.8
Mar. 6	5.15	5.15	1.9	Dec. 23	4.4	4.4	1.0
Mar. 13	5.2	5.2	2.0	Dec. 30	4.3		1.2
Mar. 18	5.2	5.2	2.0				

NOTE.—Gage heights were probably affected by log jams on Grindstone Falls during June and up to July 26, when the river was reported clear. From Aug. 27 to Oct. 16, inclusive, a jam of poles and ties at the bridge was reported.

Daily gage height, in feet, of East Branch of Penobscot River at Grindstone, 1902–1909—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.[a]												
1	4.4	4.4	4.4	4.6	12.05	9.4	9.0	6.7	5.25	4.85	4.95	6.35
2	4.4	4.4	4.4	4.6	12.15	9.6	8.95	6.6	5.1	4.75	4.95	6.35
3	4.35	4.4	4.4	4.6	11.4	9.45	8.75	6.55	5.25	4.75	5.5	6.45
4	4.35	4.4	4.4	4.6	10.5	9.45	8.6	6.25	5.65	4.8	6.65	6.45
5	4.3	4.4	4.45	4.6	9.95	9.25	8.55	5.95	6.05	4.85	7.4	6.45
6	4.3	4.4	4.5	4.6	9.65	9.1	8.3	5.7	5.8	4.9	8.1	6.55
7	4.3	4.4	4.5	4.6	9.3	8.9	8.0	5.55	5.65	5.0	8.85	6.55
8	4.3	4.4	4.5	4.7	9.5	8.8	7.9	5.1	5.45	5.15	9.15	6.55
9	4.3	4.4	4.5	4.7	9.6	8.5	7.8	4.95	5.35	5.35	9.45	6.65
10	4.3	4.4	4.5	4.7	9.65	8.25	7.9	5.1	5.2	5.65	9.4	6.75
11	4.3	4.4	4.5	4.7	9.6	7.95	7.6	5.3	5.15	5.7	8.95	7.25
12	4.3	4.4	4.5	4.7	9.75	7.85	7.45	5.45	5.15	5.65	8.7	9.4
13	4.3	4.4	4.5	4.7	9.85	7.65	7.55	5.75	5.05	5.55	8.2	9.05
14	4.3	4.4	4.5	4.9	9.8	7.8	7.4	5.9	5.05	5.3	7.45	8.75
15	4.3	4.4	4.5	5.1	9.75	7.8	7.2	5.95	5.1	5.1	6.65	8.65
16	4.3	4.4	4.5	5.2	10.0	7.5	6.95	6.25	5.05	4.95	6.05	8.05
17	4.3	4.4	4.5	5.25	9.95	7.3	6.7	6.45	4.95	4.85	5.8	7.65
18	4.3	4.4	4.5	5.3	10.45	7.2	6.55	6.55	4.85	4.85	5.95	6.9
19	4.3	4.4	4.5	5.3	10.7	7.1	6.15	6.65	4.9	4.85	6.05	6.85
20	4.3	4.4	4.5	5.3	10.5	7.0	5.5	6.4	4.95	4.85	6.15	6.6
21	4.3	4.4	4.5	5.4	9.95	7.3	5.1	6.15	4.95	4.9	6.35	6.55
22	4.3	4.4	4.5	5.45	9.8	7.45	4.9	5.9	4.95	5.05	6.35	6.5
23	4.3	4.4	4.5	5.5	9.6	7.5	5.85	5.65	5.05	5.15	6.35	6.45
24	4.3	4 4	4 5	5.75	9.6	8.05	6.25	5.5	5.1	5.1	6.35	6.1
25	4.3	4 4	4 5	6 4	9.45	8.45	6.1	5.6	5.15	5.0	6.35	5.95
26	4.3	4.4	4.5	7.9	9.5	8.6	6.0	5.7	5.25	4.95	6.45	5.85
27	4.3	4.4	4.6	9.0	9.35	8.75	5.8	5.9	5.25	4.95	6.55	5 65
28	4.3	4 4	4 6	9.55	9.1	8.95	6.25	5.95	5.25	4.95	6.55	5.55
29	4.3	......	4.6	10.1	9.0	9.25	6.7	5.75	5.2	4.85	6.35	5.5
30	4.3	......	4.6	11.6	9.15	9.1	7.0	5.6	4.9	4.9	6.35	5.45
31	4.35	......	4.6	......	9.15	......	6.75	5.35	......	4.95	......	5.4
1908.[a]												
1	6.05	4.95	6.8	6.85	9.4	9.75	6.2	5.55	4.55	5.65	4.6	4.95
2	6.3	4.9	6.65	6.8	11.05	8.5	5.55	5.45	4.5	5.5	4.5	5.0
3	6.5	4.85	6.4	6.45	10.6	8.15	4.9	5.35	4.55	4.7	4.5	......
4	6.55	4.85	6.35	6.35	10.0	8.0	4.9	5.3	4.45	4.85	4.5	4.45
5	6.45	4.85	6.35	6.45	9.85	7.55	4.95	5.25	4.45	4.65	4.4	......
6	6.35	4.85	6.35	6.45	9.4	7.5	5.05	5.5	4.45	4.6	4.4	......
7	6.25	4.85	6.35	6.55	9.2	7.05	5.95	5.5	4.45	4.45	4.3	......
8	6.2	4.85	6.35	6.55	9.05	6.8	7.2	5.35	4.45	4.4	4 3	......
9	5.95	4.85	6.45	6.6	9.25	6.85	7.2	5.0	4.35	4.3	4.4	......
10	5.95	4.85	6.45	6.65	9.35	6.8	5.8	4.7	4.35	4.25	4.35	4.05
11	5.95	4.85	6.45	6.65	9.2	6.75	7.1	4.6	5.3	4.4	4.45	......
12	5.95	4.85	6.45	6.15	8.0	6.7	7.2	4.5	5.55	4.7	4.6	......
13	5.85	4.85	6.45	6.1	7.9	6.65	6.55	4.6	5.45	4.6	4.7	......
14	5.85	4.95	6.45	5.85	8.25	6.55	5.75	5.7	5.4	4.5	4.6	4.0
15	5.85	5.15	6.45	5.85	8.3	6.35	7.3	5.45	5.2	4.35	4.6	......
16	5.85	5.35	6.45	5.85	8.35	6.15	7.45	5.1	5.1	4.25	4.65	......
17	5.85	5.75	6.45	6.05	8.2	6.4	7.35	4.95	4.95	4.2	4.65	3.95
18	5.85	5.95	6.6	6.6	8.2	6.05	7.35	5.15	5.05	4.2	......	......
19	5.5	6.25	6.65	6.7	8.25	5.95	7.3	5.55	5.05	4.2	......	......
20	5.35	6.45	6.65	6.7	8.2	6.15	7.15	5.2	4.75	4.2	......	......
21	5.25	6.7	6.65	6.75	7.25	6.35	7.05	5.0	4.65	4.1	......	......
22	5.05	6.85	6.75	6.75	7.7	6.3	7.5	4.85	4.55	4.1	11.1	3.85
23	4.95	6.85	6.75	6.45	7.3	6.05	7.55	4.9	4.45	4.1	......	......
24	4.95	6.85	6.75	6.5	6.95	5.9	6.9	5.45	4.35	4.1	......	......
25	4.95	6.85	6.75	7.0	7.7	5.6	6.3	6.0	4.35	4.1	......	......
26	4.95	6.85	6.85	8.75	8.4	6.4	6.15	5.9	4.35	4.1	5.25	3.85
27	4 95	6.85	6.85	8.95	8.2	6.7	6.0	5.8	4.35	4.4	5.4	......
28	4.95	6.85	6.85	9.55	8.45	6.7	5.8	5.65	4.35	5.1	5.65	......
29	4.95	6.85	6.85	10.05	8.25	6.7	5.75	5 25	4.25	4.75	5.3	3.75
30	4 95	......	6.85	9.8	80.5	6.75	5.65	4.85	5.75	4.7	5.1	......
31	4.95	......	6.85	......	9.3	......	5.6	4.55	......	4.6	......	......

[a] River frozen Jan. 1 to Apr. 23, 1907, about Jan. 3 to Apr. 22, Nov. 17 to 25, and Dec. 3 to 31, 1908. During 1907 gage heights are to the top of the ice, except during March, when there was a considerable depth of water on the ice. During 1908 gage heights were taken to water surface in a hole cut in the ice. During May and June, 1907, the gage heights were affected by accumulations of logs at the bridge and below.

Daily gage height, in feet, of East Branch of Penobscot River at Grindstone, 1902–1909—Con.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.[a]												
1	......	5.3	......	......	8.0	7.9	6.6	5.0	5.6	9.5	5.5	6.9
2	4.6	......	6.6	......	7.95	7.9	6.45	4.95	5.8	8.35	5.5	6.75
3	......	......	......	7.1	8.25	7.8	6.4	4.9	5.75	7.65	5.55	6.55
4	4.6	5.3	6.5	......	8.3	7.9	6.9	4.9	5.6	7.35	6.65	6.4
5	......	......	......	......	8.55	7.7	6.8	4.9	5.65	7.4	6.7	6.4
6	......	5.3	6.3	7.1	8.5	6.1	6.7	4.8	6.75	7.55	6.45	6.35
7	7.1	......	......	......	8.9	6.6	6.75	4.8	6.3	7.7	6.15	6.3
8	......	......	......	......	9.35	7.3	7.0	4.8	5.95	7.85	6.0	6.25
9	6.1	5.3	6.1	......	9.7	7.75	7.2	4.8	5.75	7.85	5.95	6.15
10	......	......	......	8.0	10.2	7.65	7.0	4.8	5.45	7.65	6.0	6.1
11	5.8	......	6.2	......	11.4	7.7	6.7	4.9	5.4	7.45	6.0	5.95
12	......	5.2	......	......	11.2	7.35	6.2	4.9	5.4	7.3	5.9	5.9
13	......	......	6.1	7.8	10.7	7.2	5.95	4.85	5.3	7.05	5.9	5.9
14	......	......	......	......	10.25	7.7	5.9	4.75	5.15	6.75	5.9	6.15
15	5.5	5.2	......	......	9.75	7.7	6.1	4.7	5.1	6.5	5.8	6.15
16	......	......	6.1	10.5	9.5	7.65	6.5	4.7	5.0	6.35	5.75	6.1
17	......	......	......	10.1	9.25	7.6	6.7	4.65	5.0	6.15	5.7	6.05
18	5.4	5.2	......	9.3	8.95	8.0	6.4	4.6	4.9	6.05	5.6	6.0
19	......	......	6.0	9.2	8.8	9.1	5.65	5.05	4.8	5.9	5.5	5.95
20	......	......	......	9.5	8.4	7.55	6.2	5.2	4.8	5.75	5.5	5.9
21	5.3	......	......	9.8	8.4	7.1	6.05	5.25	4.8	5.7	5.5	5.85
22	......	6.9	5.9	10.4	8.15	7.0	5.65	5.1	4.8	5.7	5.5	5.7
23	......	......	......	9.85	8.15	7.0	5.6	5.05	4.75	5.85	5.5	......
24	......	......	......	9.75	8.4	7.1	5.55	5.25	4.7	5.9	6.0	......
25	5.3	6.9	5.9	9.6	8.3	7.0	5.5	5.7	4.65	5.9	6.25	......
26	......	......	......	9.2	8.15	6.9	5.5	6.0	4.65	6.05	7.95	......
27	......	......	6.8	9.0	7.7	6.8	5.35	6.0	6.3	6.1	7.8	5.8
28	5.3	6.8	......	9.0	7.6	6.7	5.3	6.0	9.5	5.95	7.4	......
29	......	......	7.0	8.6	8.0	6.7	5.2	5.9	13.4	5.75	7.1	......
30	......	......	......	8.2	8.3	6.7	5.05	5.75	12.0	5.65	7.7	5.8
31	......	......	7.4	......	8.2	......	5.0	5.6	......	5.6	......	......

[a] Gage heights affected by ice Jan. 1 to Apr. 15 and Dec. 1 to 31, 1909. Gage heights Jan. 1 to Apr. 10 and Dec. 27 to 31, 1909, are to top of ice. Logs jammed on bridge pier Apr. 28 to 30, 1909.

Rating table for East Branch of Penobscot River at Grindstone, 1902–1909.[a]

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
3.80	140	5.40	940	7.00	3,130	9.20	8,380
3.90	160	5.50	1,030	7.10	3,310	9.40	8,980
4.00	185	5.60	1,130	7.20	3,495	9.60	9,580
4.10	210	5.70	1,235	7.30	3,685	9.80	10,180
4.20	240	5.80	1,345	7.40	3,880	10.00	10,780
4.30	275	5.90	1,460	7.50	4,080	10.20	11,380
4.40	315	6.00	1,580	7.60	4,285	10.40	12,000
4.50	360	6.10	1,705	7.70	4,495	10.60	12,620
4.60	405	6.20	1,840	7.80	4,710	10.80	13,240
4.70	455	6.30	1,980	7.90	4,930	11.00	13,860
4.80	510	6.40	2,130	8.00	5,155	12.00	16,960
4.90	570	6.50	2,285	8.20	5,620	13.00	20,160
5.00	630	6.60	2,445	8.40	6,110	14.00	23,360
5.10	700	6.70	2,610	8.60	6,630		
5.20	775	6.80	2,780	8.80	7,190		
5.30	855	6.90	2,955	9.00	7,780		

[a] The above rating supersedes all ratings previously published for this station.

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on discharge measurements made during 1902–1909, and is well defined between gage heights 4.5 and 10 feet.

Daily discharge, in second-feet, of East Branch of Penobscot River at Grindstone, 1902–1909.

Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.	Day.	Oct.	Nov.	Dec.
1	....	1,770	1,030	11	....	1,130	855	21	....	1,080	....
2	....	1,640	1,030	12	....	1,180	855	22	....	1,130	....
3	....	1,460	940	13	....	1,340	855	23	735	1,130	....
4	....	1,460	775	14	....	1,080	....	24	700	1,130	....
5	....	1,460	775	15	....	1,030	....	25	700	1,080	....
6	....	1,340	855	16	....	1,030	....	26	700	1,030	....
7	....	1,340	855	17	....	1,240	....	27	700	1,130	....
8	....	1,240	855	18	....	1,130	....	28	1,030	1,240	....
9	....	1,180	855	19	....	1,080	....	29	4,390	1,080	....
10	....	1,240	855	20	....	1,030	....	30	3,220	1,030	....
								31	2,200	....	....

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.										
1	....	4,820	5,620	1,240	630	4,280	460	510	360	....
2	....	4,180	5,270	1,180	630	3,880	360	430	360	....
3	....	4,280	4,820	1,240	630	3,980	360	360	360	....
4	....	5,740	4,500	1,180	630	3,880	360	360	360	....
5	....	5,860	3,400	1,130	630	3,590	360	360	380	....
6	....	4,930	2,610	1,130	665	3,310	360	360	480	....
7	....	4,390	2,200	1,130	1,840	3,310	315	315	510	....
8	....	4,080	2,700	1,030	2,280	3,310	275	255	510	....
9	....	4,930	3,980	1,030	2,060	3,400	275	210	510	....
10	....	6,110	3,500	1,030	2,610	3,220	275	210	510	....
11	....	6,110	3,500	570	3,880	2,610	275	210	570	....
12	....	5,860	3,310	940	1,910	1,770	275	210	700	....
13	....	5,620	3,500	1,580	940	1,580	275	315	985	....
14	....	5,380	4,080	2,780	940	1,400	315	315	940	....
15	....	5,380	5,380	1,840	1,460	1,240	315	275	815	....
16	....	5,860	5,620	1,130	3,880	1,080	315	275	775	....
17	....	5,620	5,980	940	4,930	570	360	240	700	....
18	....	4,180	6,110	815	4,820	455	360	360	700	....
19	....	3,680	5,620	940	4,710	405	360	570	600	....
20	....	3,130	3,310	855	4,930	570	1,840	480	480	....
21	....	2,960	3,310	855	4,930	1,240	1,840	380	405	....
22	....	3,130	2,860	855	4,710	815	1,700	360	405	....
23	....	3,400	2,440	855	3,980	665	1,520	360	335	....
24	....	3,310	1,460	855	1,980	510	1,340	360	295	....
25	10,800	3,680	940	855	1,640	455	1,130	360	275	....
26	10,800	4,080	775	775	1,770	405	985	360	275	....
27	10,300	4,710	775	700	3,500	455	775	360	240	....
28	8,680	4,930	855	700	4,500	360	665	360	225	....
29	6,910	5,270	700	630	4,500	360	550	360	....	....
30	6,110	5,620	700	630	4,500	360	510	360	....	....
31	5,740	....	700	....	4,280	360	....	360	....	....
1904.										
1	....	....	11,700	6,910	1,700	3,130	405	3,400	1,130	....
2	....	....	13,200	6,630	1,980	2,780	405	3,680	1,130	....
3	....	....	11,300	5,620	2,440	2,440	455	3,680	1,130	....
4	....	....	9,580	3,590	2,780	2,440	940	2,960	855	....
5	....	....	9,580	3,780	2,780	2,610	1,130	2,360	855	....
6	....	....	8,980	5,620	2,130	2,780	940	1,980	855	....
7	....	....	6,110	4,930	1,840	3,040	665	1,700	855	....
8	....	....	4,390	4,930	1,840	3,130	630	1,640	855	....
9	....	....	3,680	5,270	1,840	3,130	630	1,460	855	....
10	....	....	4,600	5,620	1,840	3,130	510	1,340	855	....
11	....	....	5,860	5,620	1,840	3,130	455	1,340	775	....
12	....	....	7,930	5,620	1,840	2,780	453	1,400	775	....
13	....	....	9,280	5,270	1,840	2,780	455	1,130	855	....
14	....	....	6,770	5,270	1,640	940	455	1,130	855	....
15	....	....	6,630	1,980	1,180	1,340	700	1,130	855	....
16	....	....	3,680	2,130	1,130	1,340	1,840	1,130	855	....
17	....	2,280	6,910	2,280	1,700	1,080	815	1,130	855	....
18	....	2,280	5,500	2,440	2,130	985	1,130	1,030	855	....
19	....	2,280	6,110	1,770	2,360	815	1,180	1,030	855	....
20	....	2,280	7,050	855	2,440	775	1,240	940	855	....

Daily discharge, in second-feet, of East Branch of Penobscot River at Grindstone, 1902–1909—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.										
21	....	2,610	7,780	1,030	2,780	1,030	1,080	940	855	....
22	....	3,130	4,390	940	2,780	855	895	2,960	855	....
23	....	3,500	5,040	700	3,040	855	855	3,400	855	....
24	....	3,500	4,930	700	3,500	940	855	2,060	855	....
25	....	4,600	3,980	700	3,500	775	1,340	1,980	855	....
26	....	5,860	3,500	775	3,500	775	1,640	1,840	....	....
27	....	7,780	4,930	775	3,500	775	1,700	1,700	....	....
28	....	8,380	6,910	775	3,500	570	1,700	1,580	....	....
29	....	8,380	7,480	775	3,500	540	2,360	1,580	....	....
30	....	10,500	6,910	1,460	3,500	455	2,960	1,290	....	....
31	....	....	6,910	....	3,310	405	....	1,130	....	....
1905.										
1	....	....	3,780	1,910	895	940	3,680	240	360	....
2	....	....	3,590	1,520	940	665	3,680	225	360	....
3	....	....	3,310	1,640	1,080	570	3,680	210	360	....
4	....	....	3,040	2,200	1,080	480	3,220	210	360	....
5	....	....	2,130	3,400	1,080	455	1,910	210	315	....
6	....	....	1,400	3,780	1,130	510	1,700	210	315	....
7	....	7,630	1,520	3,220	895	570	1,400	210	315	....
8	....	6,500	1,460	3,220	855	570	855	210	315	....
9	....	6,110	1,400	3,220	895	570	735	315	315	....
10	....	4,820	1,400	3,400	940	430	510	275	315	....
11	....	3,980	1,400	3,310	2,060	405	405	210	315	....
12	....	3,980	1,400	3,220	1,770	360	315	210	360	....
13	....	3,980	1,400	3,220	1,640	360	240	210	455	....
14	....	3,500	1,700	3,220	1,580	360	240	210	455	....
15	....	3,040	1,840	3,220	1,460	360	315	210	455	....
16	....	3,040	2,060	3,220	1,460	360	315	210	455	....
17	....	2,610	2,280	2,780	1,460	360	360	240	455	....
18	....	1,910	3,130	1,910	1,770	360	360	275	455	....
19	....	1,770	3,880	895	2,610	360	360	275	....	....
20	....	1,770	4,180	940	2,960	360	360	275	....	....
21	....	2,860	4,080	735	2,960	360	360	275	....	....
22	....	3,590	3,590	665	2,960	360	360	275	....	....
23	....	4,600	3,590	665	2,860	315	275	275	....	....
24	....	4,820	3,590	665	2,780	315	240	275	....	....
25	....	4,930	3,980	700	3,130	315	240	195	....	....
26	....	3,780	4,180	815	3,780	1,400	240	160	....	....
27	....	3,130	4,180	815	3,880	1,840	240	160	....	....
28	....	3,220	3,590	855	3,880	2,060	240	160	....	....
29	....	3,220	3,400	895	3,880	2,780	240	140	....	....
30	....	3,400	2,440	895	3,880	2,960	240	140	....	....
31	....	....	2,060	....	3,880	3,310	....	140	....	....
1906.										
1	....	....	8,980	3,310	540	405	1,580	570	480	855
2	....	....	9,580	3,500	985	360	1,460	570	570	855
3	....	....	9,880	4,930	1,840	405	1,240	510	665	775
4	....	....	10,200	3,310	2,860	360	1,130	510	775	735
5	....	....	10,300	6,110	2,580	360	985	455	895	700
6	....	....	10,500	5,740	2,610	315	855	405	985	630
7	....	....	11,500	6,770	4,820	295	735	405	1,240	600
8	....	....	12,000	6,910	4,710	295	700	455	1,340	570
9	....	....	10,500	6,770	4,820	240	630	455	1,460	540
10	....	....	9,580	6,770	4,080	255	570	665	1,980	540
11	....	....	8,680	6,910	3,980	275	570	1,400	1,910	510
12	....	....	8,680	6,770	3,880	315	510	2,130	1,700	510
13	....	....	8,680	3,780	4,500	315	510	2,780	1,580	455
14	....	....	8,680	4,600	4,820	315	455	2,610	1,580	455
15	....	....	7,780	3,590	4,390	295	455	2,280	1,520	455
16	....	....	7,780	2,860	4,390	275	455	2,130	1,460	405
17	....	....	7,780	2,360	4,280	255	455	1,770	1,460	360
18	....	....	7,190	4,710	4,080	240	510	1,700	1,400	360
19	....	....	6,910	2,360	3,680	240	540	1,340	1,460	335
20	....	....	6,630	2,200	3,780	210	570	1,080	1,520	315

Daily discharge, in second-feet, of East Branch of Penobscot River at Grindstone, 1902–1909—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.										
21	....	6,910	6,500	2,130	3,780	210	630	985	1,770	315
22	....	6,910	8,680	2,280	3,310	240	700	940	1,910	315
23	....	6,910	7,780	1,130	3,680	240	700	775	1,840	315
24	....	4,710	6,910	1,400	2,960	240	700	735	1,700	315
25	....	5,270	7,480	1,290	2,360	240	665	700	[a] 1,460	315
26	....	6,110	7,050	985	2,130	360	630	630	1,400	315
27	....	6,910	7,190	815	1,840	430	630	665	1,290	275
28	....	7,480	6,110	940	1,770	570	600	735	1,240	275
29	....	8,080	5,980	540	1,290	855	570	665	1,130	275
30	....	8,830	3,680	540	815	985	510	570	1,030	275
31	....	....	3,500	....	540	1,290	....	510	....	275
1907.										
1	....	....	17,100	....	7,780	2,610	815	540	600	2,060
2	....	....	17,400	....	7,630	2,440	700	482	600	2,060
3	....	....	15,100	....	7,050	2,360	815	482	1,030	2,210
4	....	....	12,300	....	6,630	1,910	1,180	510	2,530	2,210
5	....	....	....	....	6,500	1,520	1,640	540	3,880	2,210
6	....	....	....	....	5,860	1,240	1,340	570	5,380	2,360
7	....	....	....	....	5,160	1,080	1,180	630	7,340	2,360
8	....	....	....	....	4,930	700	985	738	8,230	2,360
9	....	....	....	....	4,710	600	898	898	9,130	2,530
10	....	....	....	....	4,930	700	775	1,180	8,980	2,700
11	....	....	....	....	4,280	855	738	1,240	7,630	3,590
12	....	....	....	....	3,980	985	738	1,180	6,900	8,980
13	....	....	....	....	4,180	1,290	665	1,080	5,620	7,930
14	....	....	....	....	3,880	1,460	665	855	3,980	7,050
15	....	....	....	....	3,500	1,520	700	700	2,530	6,770
16	....	....	....	....	3,040	1,910	665	600	1,640	5,270
17	....	....	....	....	2,610	2,210	600	540	1,340	4,390
18	....	....	....	....	2,360	2,360	540	540	1,520	2,960
19	....	....	....	....	1,770	2,530	570	540	1,640	2,870
20	....	....	....	....	1,030	2,130	600	540	1,770	2,440
21	....	....	....	....	700	1,770	600	570	2,060	2,360
22	....	....	....	....	570	1,460	600	665	2,060	2,280
23	....	....	....	....	1,400	1,180	665	738	2,060	2,210
24	....	1,290	....	....	1,910	1,030	700	700	2,060	1,700
25	....	2,130	....	....	1,700	1,130	738	630	2,060	1,520
26	....	4,930	....	....	1,580	1,240	815	600	2,210	1,400
27	....	7,780	....	....	1,340	1,460	815	600	2,360	1,180
28	....	9,430	....	....	1,910	1,520	815	600	2,360	1,080
29	....	11,100	....	....	2,610	1,290	775	540	2,060	1,030
30	....	15,700	....	....	3,130	1,130	570	570	2,060	985
31	....	....	....	....	2,700	898	....	600	....	940
1908.										
1	....	....	8,980	10,000	1,840	1,080	382	1,180	405	600
2	....	....	14,000	6,360	1,080	985	360	1,030	360	630
3	....	....	12,600	5,500	570	898	382	455	360	....
4	....	....	10,800	5,160	570	855	338	430	360	....
5	....	....	10,300	4,180	600	815	338	430	315	....
6	....	....	8,980	4,080	665	1,030	338	405	315	....
7	....	....	8,380	3,220	1,520	1,030	338	338	275	....
8	....	....	7,930	2,780	3,500	898	338	315	275	....
9	....	....	8,530	2,870	3,500	630	295	275	315	....
10	....	....	8,830	2,780	1,340	455	295	258	295	....
11	....	....	8,380	2,700	3,310	405	855	315	338	....
12	....	....	5,160	2,610	3,500	360	1,080	455	405	....
13	....	....	4,930	2,530	2,360	405	985	405	455	....
14	....	....	5,740	2,360	1,290	1,240	940	360	405	....
15	....	....	5,860	2,060	3,680	985	775	295	405	....
16	....	....	5,980	1,770	3,980	700	700	258	430	....
17	....	....	5,620	2,130	3,780	600	600	240	430	....
18	....	....	5,620	1,640	3,780	738	665	240	....	....
19	....	....	5,740	1,520	3,680	1,080	665	240	....	....
20	....	....	5,620	1,770	3,400	775	482	240	....	....

[a] Although the river was frozen over Nov. 25 to Dec. 31, an inspection of the gage heights and ice notes for that period seems to warrant the application of the open-channel rating with a fair degree of accuracy.

Daily discharge, in second-feet, of East Branch of Penobscot River at Grindstone, 1902–1909—Continued.

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.										
21	....	....	3,590	2,060	3,220	630	430	210	....	....
22	....	....	4,500	1,980	4,080	540	382	210	....	....
23	....	2,210	3,680	1,640	4,180	570	338	210	....	....
24	....	2,280	3,040	1,460	2,960	985	295	210	....	....
25	....	3,130	4,500	1,130	1,980	1,580	295	210	....	....
26	....	7,050	6,110	2,130	1,770	1,460	295	210	815	....
27	....	7,630	5,620	2,610	1,580	1,340	295	315	940	....
28	....	9,430	6,240	2,610	1,340	1,180	295	700	1,180	....
29	....	10,900	5,740	2,610	1,290	815	258	482	855	....
30	....	10,200	5,270	2,700	1,180	540	1,290	455	700	....
31	....	....	8,680	....	1,130	382	....	405	....	....
1909.										
1	....	....	5,160	4,930	2,440	630	1,130	9,280	1,030	2,960
2	....	....	5,040	4,930	2,210	600	1,340	5,980	1,030	2,700
3	....	....	5,740	4,710	2,130	570	1,290	4,390	1,080	2,360
4	....	....	5,860	4,930	2,960	570	1,130	3,780	2,520	2,130
5	....	....	6,500	4,500	2,780	570	1,180	3,880	2,610	2,130
6	....	....	6,360	1,700	2,610	510	2,700	4,180	2,210	2,060
7	....	....	7,480	2,440	2,700	510	1,980	4,500	1,770	1,980
8	....	....	8,830	3,680	3,130	510	1,520	4,820	1,580	1,910
9	....	....	9,880	4,600	3,500	510	1,290	4,820	1,520	1,770
10	....	....	11,400	4,390	3,130	510	985	4,390	1,580	1,700
11	....	....	15,100	4,500	2,610	570	940	3,980	1,580	1,520
12	....	....	14,500	3,780	1,840	570	940	3,680	1,460	1,460
13	....	....	12,900	3,500	1,520	540	855	3,220	1,460	1,460
14	....	....	11,500	4,500	1,460	482	738	2,700	1,460	1,770
15	....	....	10,000	4,500	1,700	455	700	2,280	1,340	1,770
16	....	12,300	9,280	4,390	2,280	455	630	2,060	1,290	1,700
17	....	11,100	8,530	4,280	2,610	430	630	1,770	1,240	1,640
18	....	8,680	7,630	5,160	2,130	405	570	1,640	1,130	1,580
19	....	8,380	7,190	8,080	1,180	665	510	1,460	1,030	1,520
20	....	9,280	6,110	4,180	1,840	775	510	1,290	1,030	1,460
21	....	10,200	6,110	3,310	1,640	815	510	1,240	1,030	1,400
22	....	12,000	5,500	3,130	1,180	700	510	1,240	1,030	....
23	....	10,300	5,500	3,130	1,130	665	482	1,400	1,030	....
24	....	10,000	6,110	3,310	1,080	815	455	1,460	1,580	....
25	....	9,580	5,860	3,130	1,030	1,240	430	1,460	1,910	....
26	....	8,380	5,500	2,960	1,030	1,580	430	1,640	5,040	....
27	....	7,780	4,500	2,780	898	1,580	1,980	1,700	4,710	....
28	....	[a] 6,230	4,280	2,610	855	1,580	9,280	1,520	3,880	....
29	....	[a] 5,300	5,160	2,610	775	1,460	21,400	1,290	3,310	....
30	....	[a] 4,500	5,860	2,610	665	1,290	17,000	1,180	4,500	....
31	....	....	5,620	....	630	1,130	....	1,130	....	....

[a] Jam of logs on pier. Coefficient of 80 per cent used.

Monthly discharge of East Branch of Penobscot River at Grindstone, 1902–1909.

[Drainage area, 1,100 square miles.[a]]

Month	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1902.						
Oct. 23–31	4,390	700	1,600	1.45	0.49	A.
November	1,770	1,030	1,220	1.11	1.24	A.
Dec. 1–13	1,030	775	876	.796	.38	A.
1903.						
Mar. 25–31	10,800	5,740	8,480	7.71	2.00	A.
April	6,110	2,960	4,710	4.28	4.78	A.
May	6,110	700	3,240	2.95	3.40	A.
June	2,780	570	1,050	.955	1.07	A.
July	4,930	630	2,750	2.50	2.88	A.
August	4,280	360	1,740	1.58	1.82	A.
September	1,840	275	634	.576	.63	A.
October	570	210	342	.311	.36	B.
Nov. 1–28	985	225	502	.456	.47	A.
1904.						
Apr. 17–30	10,500	2,280	4,810	4.37	2.28	A.
May	13,200	3,500	6,830	6.21	7.16	A.
June	6,910	700	3,160	2.87	3.20	A.
July	3,500	1,130	2,440	2.22	2.56	A.
August	3,130	405	1,700	1.55	1.79	A.
September	2,960	405	1,030	.936	1.04	A.
October	3,680	940	1,810	1.65	1.90	A.
Nov. 1–25	1,130	775	882	.802	.74	A.
1905.						
Apr. 7–30	7,630	1,770	3,840	3.49	3.12	A.
May	4,180	1,400	2,740	2.49	2.87	A.
June	3,780	665	2,040	1.84	2.05	A.
July	3,880	855	2,140	1.95	2.25	A.
August	3,310	315	820	.745	.86	A.
September	3,680	240	910	.827	.92	B.
October	315	140	220	.200	.23	B.
Nov. 1–18	455	315	374	.340	.23	B.
1906.						
Apr. 21–30[b]	8,830	4,710	6,810	6.20	2.30	A.
May	12,000	3,500	8,150	7.41	8.54	A.
June	6,910	540	3,540	3.22	3.59	A.
July	4,820	540	3,100	2.82	3.25	A.
August	1,290	210	377	.343	.40	B.
September	1,580	455	708	.644	.72	A.
October	2,780	405	1,040	.945	1.09	A.
November	1,980	480	1,360	1.24	1.38	B.
December	855	275	459	.417	.48	C.
1907.[c]						
January	....	....	800	0.727	0.84	D.
February	....	....	350	.318	.33	D.
March	....	....	300	.273	.31	D.
April	15,700	....	1,970	1.79	2.00	B.
May	17,400	....	8,000	7.27	8.38	D.
June	....	....	5,000	4.55	5.08	D.
July	7,780	570	3,590	3.26	3.76	B.
August	2,610	600	1,500	1.36	1.57	A.
September	1,640	540	797	.725	.81	A.
October	1,240	482	684	.622	.72	A.
November	9,130	600	3,450	3.14	3.50	A.
December	8,980	940	2,970	2.70	3.11	A.
The year	17,400	....	2,450	2.23	30.41	

[a] Includes Chamberlain Lake drainage, 270 square miles.

[b] A monthly mean for April of 3,180 second-feet has been obtained by estimating the discharge for Apr. 1 to 20.

[c] Discharge during the frozen period, 1907, based largely on the natural flow of North Branch of Penobscot River at Millinocket.

Discharges for May and June, 1907, are rough estimates to allow as nearly as possible for the effect of log jams.

Discharge Apr. 1 to 23, 1907, 600 second-feet.

Monthly discharge of East Branch of Penobscot River at Grindstone, 1902–1909—Contd.

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1908.[a]						
January	1,980		928	0.844	0.97	D.
February	1,340		688	.625	.67	D.
March			1,040	.945	1.09	D.
April	10,900		2,710	2.46	2.74	B.
May	14,000	3,040	6,930	6.30	7.26	A.
June	10,000	1,130	2,960	2.69	3.00	A.
July	4,180	570	2,340	2.13	2.46	A.
August	1,580	360	838	.762	.88	A.
September	1,290	258	511	.464	.52	A.
October	1,180	210	380	.345	.40	A.
November	1,180	275	434	.395	.44	A.
December	630		175	.159	.18	D.
The year	14,000		1,660	1.51	20.61	
1909.[b]						
January			660	0.600	0.69	D.
February			440	.400	.42	D.
March			770	.700	.81	D.
April	12,300		5,070	4.61	5.14	C.
May	15,100	4,280	7,580	6.89	7.94	B.
June	8,080	1,700	3,910	3.56	3.97	A.
July	3,500	630	1,860	1.69	1.95	A.
August	1,580	405	764	.695	.80	A.
September	21,400	430	2,470	2.25	2.51	A.
October	9,280	1,130	2,880	2.62	3.02	A.
November	5,040	1,030	1,930	1.75	1.95	A.
December	2,960		1,470	1.34	1.54	B.
The year	21,400	105	2,490	2.26	30.73	

[a] Discharge during the frozen periods, 1908, based on climatologic reports, the discharge of adjacent drainages, and one discharge measurement made under ice conditions.

	Second-feet.
Discharge Apr. 1 to 22, 1908	1,300
Discharge Nov. 18 to 25, 1908	300

[b] Discharge estimated for periods of ice conditions, 1909, based on studies of climatologic data and comparisons with other stations.

	Second-feet.
Mean discharge Apr. 1 to 15, 1909, estimated	1,200
Mean discharge Dec. 22 to 31, 1909, estimated	660

MATTAWAMKEAG RIVER AT MATTAWAMKEAG.

Mattawamkeag River rises near the eastern boundary of Maine and drains a country that is generally low and swampy, although there are on the river a few good sites for power development, none of which have been utilized. Dams are maintained at the outlets of several large lakes and ponds in this drainage basin, but the stored water is used only for log driving. The total area of the basin is about 1,500 square miles.

The gaging station, which was established August 26, 1902, is located at the Maine Central Railroad bridge in the village of Mattawamkeag, about half a mile from the mouth of the river.

The datum of the gage has remained the same during the maintenance of the station. It is 85.93 feet above mean sea level, as determined by the Penobscot River survey of 1904. The discharge is affected by ice during the winter and is also occasionally affected by log jams for short periods in the log-driving season. When the channel is unobstructed conditions are good for obtaining accurate discharge data. A very good rating curve has been developed. (See Pl. IV.)

Discharge measurements of Mattawamkeag River at Mattawamkeag, 1902–1909.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
1902.	*Feet.*	*Second-feet.*	1905.	*Feet.*	*Second-feet.*
July 31	4.40	1,170	June 23	4.91	1,460
Aug. 27	4.70	1,600	Oct. 24	2.65	117
Sept. 16	5.00	1,680	Oct. 25 [b]	2.62	104
Nov. 8	5.89	3,050	Nov. 15 [b]	3.61	385
1903.			1906.		
Apr. 4	9.15	9,780	Aug. 23	3.08	250
Apr. 25	7.15	5,410			
May 18	4.58	1,260	1907.		
May 25	4.45	1,110	Mar. 6	5.94	482
June 11	4.02	742	Mar. 26	6.40	752
Aug. 8	3.87	558	May 8	10.84	15,000
Sept. 11	3.39	340	June 4	6.54	4,180
Oct. 14	2.75	121			
Oct. 23 [a]	3.32	300	1908.		
			Mar. 20	8.58	2,270
1904.			Mar. 21	8.46	2,970
Apr. 15	9.85	12,600	Apr. 15	6.70	4,380
Apr. 27	9.50	11,400	Nov. 2	5.03	1,670
Oct. 20	5.07	1,760	Dec. 10 [c]	5.38	1,100
			Dec. 23	5.40	640
1905.					
Apr. 13	9.40	10,740	1909.		
May 5	6.69	4,150	Apr. 30 [d]	9.80	12,400

[a] Measurement by wading.
[b] Measurement by wading about 1 mile above gage.
[c] Discharge affected by anchor ice.
[d] Meter held at 1 foot depth and coefficient of 0.9 used to obtain mean velocity.

Daily gage height, in feet, of Mattawamkeag River at Mattawamkeag, 1902–1909.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.						1902.					
1	....	4.10	4.60	7.85	5.65	16	....	5.00	4.80	5.40	....
2	....	4.05	4.60	7.40	5.45	17	....	5.00	4.80	5.50	7.00
3	....	4.40	4.60	7.00	5.45	18	....	4.90	4.80	5.50	7.45
4	....	4.70	4.55	6.65	5.25	19	....	4.85	4.80	5.50	7.80
5	....	4.60	4.40	6.35	5.35	20	....	4.70	4.85	5.50	(a)
6	....	4.60	4.45	6.10	5.30	21	....	4.50	5.05	5.40	....
7	....	4.50	4.75	6.00	5.35	22	....	4.40	5.20	5.50	....
8	....	4.40	5.25	5.90	7.25	23	....	4.40	5.15	5.50	....
9	....	4.30	5.45	5.75	7.05	24	....	4.40	5.00	5.50	....
10	....	4.45	5.40	5.65	6.70	25	....	4.35	4.85	5.50	....
11	....	4.50	5.20	5.45	6.45	26	4,60	4.40	4.70	5.45	....
12	....	4.60	5.10	5.30	6.40	27	4.70	4.40	4.65	5.35	....
13	....	4.70	4.95	5.25	(a)	28	4.60	4.25	5.05	5.40	....
14	....	4.80	4.90	5.20	....	29	4.50	4.30	6.80	5.55	....
15	....	4.80	4.80	5.30	....	30	4.40	4.35	7.80	5.70	....
						31	4.25	....	8.00	....	....

[a] Frozen Dec. 13 to 16 and 20 to 31, 1902.

Daily gage height, in feet, of Mattawamkeag River at Mattawamkeag, 1902–1909—**Contd.**

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.										
1	....	9.65	7.25	4.00	4.55	4.60	3.50	3.20	3.50	4.20
2	....	9.35	7.00	3.95	4.50	4.45	3.40	3.20	3.50	4.10
3	....	9.05	6.80	4.00	4.40	4.25	3.50	3.20	3.50	4.00
4	....	9.15	6.70	3.95	4.40	4.00	3.50	3.20	3.50	3.90
5	....	9.15	6.75	4.00	4.35	4.00	3.50	3.10	3.60	3.90
6	....	9.00	6.65	4.00	4.20	4.00	3.50	2.90	3.70	4.00
7	....	9.05	6.70	3.95	4.25	3.90	3.50	2.90	3.80	4.10
8	....	9.05	6.85	4.00	4.40	3.90	3.40	3.00	3.80	4.10
9	(a)	9.45	6.70	3.90	4.40	3.80	3.40	3.00	3.90	4.10
10	10.05	9.90	6.40	4.10	4.25	3.70	3.50	2.80	4.05	4.10
11	11.90	10.10	6.35	4.10	3.95	3.60	3.50	2.80	4.10	4.10
12	12.70	10.00	6.20	4.30	3.80	3.80	3.40	2.80	4.15	4.10
13	12.90	9.85	6.15	4.60	3.65	3.80	3.30	2.70	4.35	4.20
14	10.30	9.60	6.40	4.55	3.60	3.80	3.30	2.70	4.60	4.60
15	10.50	9.45	6.15	4.55	3.75	3.80	3.20	2.70	4.80	4.70
16	10.25	9.10	5.80	4.55	3.95	3.80	3.20	2.70	4.80	4.80
17	10.20	9.00	5.30	4.60	4.35	3.70	3.40	2.70	4.70	4.90
18	10.15	8.85	5.20	4.45	4.70	3.60	3.50	2.80	4.70	(b)
19	10.00	8.60	5.10	4.30	4.70	3.80	3.50	3.00	4.70	....
20	10.00	8.45	5.15	4.20	4.65	3.90	3.50	3.25	4.70	4.90
21	10.00	7.90	5.20	4.20	4.50	4.00	3.40	3.40	4.40	....
22	10.00	7.40	5.20	4.15	4.50	4.00	3.30	3.40	4.40	....
23	10.20	7.20	5.20	4.00	4.50	4.10	3.20	3.40	4.30	....
24	10.60	7.10	5.20	4.00	4.60	4.10	3.30	3.40	4.20	....
25	11.25	7.15	4.95	4.00	4.60	4.10	3.30	3.40	4.50	....
26	11.25	7.25	4.90	4.00	4.60	4.00	3.30	3.40	4.60	....
27	11.15	7.50	4.95	4.00	4.45	3.90	3.30	3.50	4.50	5.50
28	11.00	7.55	4.85	4.00	4.25	3.80	3.30	3.70	4.40	....
29	10.80	7.45	4.75	4.00	4.20	3.70	3 30	3.60	4.40	....
30	10.30	7.30	4.55	4.35	4.10	3.70	3.20	3.50	4.30	....
31	9.95	....	4.25	....	4.35	3.60	....	3.40	....	....

[a] Frozen Jan. 1 to Mar. 9.

[b] Readings Dec. 18 to 31 through ice.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
1	....	....	....	....	10.70	6.40	4.50	3.75	3.50	6.10	5.40	5.20
2	....	....	....	....	11.00	6.30	4.50	3.50	3.40	6.45	5.30	5.10
3	4.60	....	....	....	11.10	6.20	4.75	3.65	3.45	6.60	5.20	5.00
4	....	....	....	....	11.00	6.20	4.90	3.70	3.60	6.45	4.95	5.10
5	....	....	....	....	10.75	6.25	4.90	3.70	3.75	6.25	4.85	5.20
6	....	....	5.00	....	10.40	6.50	4.90	3.70	4.10	6.05	5.15	5.30
7	....	4.20	....	....	10.10	6.95	4.90	3.70	4.40	5.85	5.15	5.50
8	....	....	....	8.20	9.95	7 05	4.85	3.55	4.30	5.65	5.10	5.80
9	....	....	....	7.60	9.45	6.80	4.70	3.40	4.20	5.45	5.10	5.80
10	4.40	....	....	8.20	9.40	6.70	4.70	3.55	4.05	5.30	5.05	5.70
11	....	....	....	9.00	9.15	6.60	4.30	3.70	4.00	5.30	4.90	5.70
12	....	....	....	9.75	9.65	6.50	4.20	3.80	3.90	5.20	4.80	5.70
13	....	....	6.30	9.95	10.85	6.20	4.30	3.80	3.90	5.10	4.80	5.70
14	....	4.20	....	10.05	11.40	6.10	4.30	3.80	3.80	5.25	4.75	5.60
15	....	....	....	9.90	11.70	6.05	4.40	3.75	4.25	5.40	4.65	5.50
16	....	....	....	9.65	11.55	6.00	4.50	3.55	4.55	5.40	4.40	5.40
17	4.10	....	....	9.50	11.30	6.00	4.45	3.60	4.90	5.30	4.40	5.30
18	....	....	....	9.10	10.75	6.00	4.35	3.80	5.05	5.20	4.55	5.20
19	....	....	....	8.90	9.65	6.00	4.10	3.90	5.00	5.20	4.80	5.10
20	....	....	6.30	8.80	9.35	5.85	4.20	3.90	5.10	5.10	5.10	5.00
21	....	4.30	....	8.70	9.35	5.45	4.10	4.00	5.20	5.00	4.80	......
22	....	....	....	8.70	8.75	5.15	4.05	4.00	5.10	5.15	4.70	......
23	....	....	....	8.70	8.60	4.95	4.00	4.00	5.20	5.45	4.75	......
24	4.00	....	....	8.75	8.55	4.80	3.90	4.00	5.20	5.50	5.00	......
25	....	....	....	9.05	8.35	4.65	3.85	4.00	5.35	5.60	4.95	......

Daily gage height, in feet, of Mattawamkeag River at Mattawamkeag, 1902–1909—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
26				9.35	7.80	4.45	3.60	4.00	5.65	5.75	5.15	4.30
27			6.30	9.55	7.55	4.35	3.70	3.85	5.80	5.90	5.30	
28		4.50		9.75	7.50	4.45	3.80	3.70	5.80	5.90	5.20	
29				9.95	7.20	4.60	3.80	3.70	5.70	6.00	5.20	
30				10.30	6.75	4.60	3.90	3.65	5.75	5.85	5.20	
31	4.20				6.50		3.90	3.65		5.65		

NOTE.—River frozen Jan. 1 to Apr. 7 and Dec. 21 to 31, 1904. During frozen season readings are to water surface in hole cut in ice.

The following thicknesses of ice were measured:

	Feet.		Feet.
Jan. 3	1.2	Mar. 6, 13, 20	1.7
Jan. 10	1.6	Mar. 27	1.4
Jan. 17, 24, 31	1.7	Dec. 26	.4
Feb. 7, 14, 21, 28	1.7		

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.[a]												
1	4.0				6.9	5.3	4.2	3.5	2.8	2.7	2.6	4.9
2				11.4	6.8	5.3	4.2	3.5	2.8	2.6	2.7	4.9
3				8.85	6.7	5.3	4.2	3.5	2.8	2.6	2.7	4.7
4				8.6	6.7	5.2	4.2	3.45	2.8	2.5	3.4	4.8
5		4.7	4.9	8.45	6.65	5.2	4.2	3.3	2.9	2.5	3.5	4.9
6				8.65	6.5	5.2	4.2	3.3	3.1	2.5	3.6	5.05
7				9.2	6.3	5.2	4.2	3.3	3.1	2.5	3.6	5.0
8				9.8	6.2	5.1	4.2	3.2	3.2	2.5	3.6	4.9
9	4.2			10.0	6.1	5.1	4.2	3.2	3.2	2.5	3.6	4.8
10				10.0	6.1	4.95	4.2	3.25	3.2	2.5	3.6	4.65
11				9.9	6.1	4.85	4.1	3.4	3.1	2.5	3.7	4.5
12		4.7	4.7	9.6	6.15	4.7	4.1	3.4	3.0	2.5	3.7	4.4
13				9.45	6.1	4.65	4.0	3.4	3.0	2.6	3.7	4.4
14				9.3	5.95	4.8	4.0	3.25	3.2	2.6	3.7	4.55
15				9.3	5.65	4.95	3.9	3.1	3.4	2.6	3.6	4.8
16	4.7			9.3	5.65	5.2	3.9	3.1	3.35	2.6	3.6	4.9
17				9.15	5.9	5.55	3.8	3.0	3.3	2.5	3.7	4.9
18				8.8	6.1	5.25	3.7	3.2	3.2	2.5	3.95	4.85
19			4.7	8.4	6.5	5.35	3.7	3.2	3.2	2.6	4.25	4.75
20		4.4		8.15	6.75	5.7	3.7	3.2	3.3	2.6	4.6	4.8
21				7.9	7.35	5.6	3.7	3.15	3.2	2.7	4.3	4.8
22	4.7			7.9	7.2	5.1	3.7	3.0	3.2	2.7	4.05	4.7
23				8.0	7.2	4.95	3.7	2.9	3.1	2.7	3.9	4.7
24				8.0	7.3	4.75	3.55	2.85	2.0	2.7	3.9	4.6
25				8.0	7.15	4.55	3.4	3.0	2.95	2.7	4.0	4.6
26		4.7	4.9	7.9	6.8	4.4	3.6	3.1	2.8	2.7	4.0	4.5
27				7.7	6.45	4.3	3.7	3.0	2.8	2.7	4.0	4.5
28				7.35	6.0	4.4	3.6	2.9	2.7	2.6	4.0	4.4
29	4.7			7.1	5.6	4.3	3.45	2.9	2.7	2.6	4.15	4.4
30				7.0	5.45	4.3	3.5	2.7	2.7	2.6	4.4	4.5
31					5.3		3.5	2.8		2.6		4.5

[a] River frozen Jan. 1 to Apr. 1, and Dec. 17–31, 1905. For the first of these periods the gage-height readings were taken to the surface of the water in a hole cut in the ice. The following comparative readings were taken:

Date.	Water surface.	Top of ice.	Thickness of ice.	Date.	Water surface.	Top of ice.	Thickness of ice.
	Feet.	*Feet.*	*Feet.*		*Feet.*	*Feet.*	*Feet.*
Jan. 1	4.0		0.7	Feb. 20	4.4	4.6	1.6
Jan. 9	4.2		1.0	Feb. 26	4.7	4.9	1.6
Jan. 16	4.7		1.2	Mar. 5	4.9	5.0	1.6
Jan. 22	4.7		1.3	Mar. 12	4.7	4.9	1.6
Jan. 29	4.7	5.0	1.3	Mar. 19	4.7	4.9	1.6
Feb. 5	4.7	4.9	1.6	Mar. 26	4.9	5.1	1.6
Feb. 12	4.7	4.9	1.6				

Apr. 6, river clear of ice. May 8–9 and Nov. 3, no record; gage heights estimated. Dec. 17–31, river frozen over, but not safe to go upon; gage heights to top of ice 0.6 foot thick Dec. 31.

Daily gage height, in feet, of Mattawamkeag River at Mattawamkeag, 1902–1909—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.[a]												
1	......	8.7	......	9.7	10.4	7.2	4.45	3.6	3.35	2.7	6.2	5.4
2	......	8.4	......	......	10.6	7.05	4.2	3.8	3.25	2.6	6.1	5.45
3	......	8.0	......	......	10.7	6.7	4.0	3.8	3.2	2.6	6.0	5.5
4	......	7.7	9.2	......	10.8	6.8	4.2	3.75	3.3	2.6	6.0	......
5	......	......	......	......	11.05	7.35	4.5	3.7	3.6	2.6	6.1	......
6	......	......	......	......	11.1	7.1	4.35	3.7	3.6	2.5	6.2	......
7	3.7	......	......	......	11.1	6.9	4.4	3.7	3.7	2.7	6.05	......
8	......	9.5	......	......	11.1	6.7	4.25	3.65	3.6	3.0	5.9	......
9	......	......	......	......	10.9	6.6	3.95	3.6	3.5	3.3	5.8	5.7
10	......	......	......	......	10.7	6.2	4.2	3.45	3.5	3.65	5.85	......
11	......	......	......	......	10.7	5.8	4.1	3.4	3.4	4.4	6.0	......
12	......	......	8.5	......	10.4	5.4	4.2	3.4	3.4	5.75	6.0	......
13	......	9.5	......	......	10.1	4.9	4.3	3.4	3.2	6.0	5.9	......
14	3.7	......	......	8.6	9.9	4.6	4.4	3.35	3.1	6.0	5.8	......
15	......	......	......	8.6	9.95	4.45	4.5	3.3	3.0	5.9	5.8	......
16	......	......	......	9.8	9.55	4.3	4.4	3.3	3.0	5.8	5.8	6.6
17	......	......	......	9.6	9.25	4.1	4.3	3.3	2.8	5.65	5.9	......
18	......	......	8.6	9.75	8.9	3.9	4.3	3.3	2.6	5.45	5.9	......
19	......	......	......	10.1	8.8	3.8	4.2	3.3	2.5	5.2	6.0	......
20	......	8.8	......	10.55	8.25	4.05	4.2	3.2	2.6	4.85	6.2	......
21	......	......	......	10.65	7.5	4.65	4.5	3.1	2.6	4.8	6.3	......
22	3.8	......	......	10.7	7.2	5.05	4.2	3.05	2.6	4.7	6.3	......
23	......	......	......	10.7	7.05	5.5	4.2	3.15	2.65	4.8	6.2	6.9
24	......	......	......	10.75	7.4	5.6	4.2	3.2	2.7	5.0	6.1	......
25	11.6	9.3	8.4	10.8	7.2	5.6	4.2	3.2	2.7	5.1	6.0	......
26	11.6	......	......	10.6	6.55	5.6	4.2	3.2	2.7	5.55	5.8	......
27	11.4	......	......	10.6	6.5	5.2	4.2	3.2	2.7	5.95	5.7	......
28	11.05	......	......	10.4	6.4	4.9	4.1	3.3	2.7	6.15	5.7	......
29	11.0	......	......	10.4	6.45	4.8	4.1	3.4	2.7	6.3	5.5	......
30	10.75	......	......	10.3	6.8	4.55	3.85	3.45	2.7	6.2	5.3	6.7
31	9.0	......	......	......	6.8	......	3.7	3.5	......	6.2	......	......

[a] The following ice condition prevailed during 1906: River frozen over Jan. 1 to 24; open Jan. 25 to Feb. 3; frozen Feb. 4 to Apr. 13; clear of ice Apr. 17. River frozen Dec. 4 to 31. During the frozen period gage heights were taken to water surface through a hole in the ice. The following comparative readings were taken:

Date.	Water surface.	Top of ice.	Thickness of ice.	Date.	Water surface.	Top of ice.	Thickness of ice.
	Feet.	*Feet.*	*Feet.*		*Feet.*	*Feet.*	*Feet.*
Jan. 7	3.7	8.7	1.1	Mar. 12	8.5	8.7	1.2
Jan. 14	3.7	3.7	1.3	Mar. 18	8.6	8.7	1.5
Jan. 22	3.8	3.8	1.5	Mar. 25	8.4	8.5	1.4
Feb. 4	7.7	7.7	.6	Apr. 1	9.7	9.8	1.2
Feb. 8	9.5	9.7	.8	Apr. 8	....	9.9	....
Feb. 13	9.5	9.3	.8	Dec. 9	5.7	5.8	.5
Feb. 20	8.8	8.6	1.1	Dec. 16	6.6	6.7	.7
Feb. 25	9.3	9.5	.9	Dec. 23	6.9	7.0	.9
Mar. 4	9.2	9.4	1.0	Dec. 30	6.7	6.8	1.0

Daily gage height, in feet, of Mattawamkeag River at Mattawamkeag, 1902–1909—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.[a]												
1					13.7	5.75	8.5	6.45	4.25	4.8	5.6	5.8
2			5.9		13.9	5.75	8.6	6.75	3.95	4.8	5.6	5.8
3		6.6			13.6	6.05	8.6	6.8	3.8	4.7	5.65	5.9
4						6.55	8.5	6.65	3.9	4.6	6.05	6.0
5	7.2					6.6	8.1	6.5	4.6	4.5	6.2	6.1
6			5.95	8.3		6.85	7.85	6.5	5.0	4.55	6.25	6.2
7					10.65	7.05	7.4	6.6	5.55	4.75	6.6	6.3
8					10.3	7.2	7.05	6.5	5.65	5.15	7.3	6.3
9					9.8	7.75	6.85	6.3	5.45	5.8	7.65	6.3
10			6.0		9.2	7.75	6.65	6.05	5.3	6.45	7.8	6.4
11					8.75	7.55	6.4	5.75	5.15	6.85	7.6	6.7
12	7.4				8.35	7.35	6.2	5.55	5.0	7.0	7.25	7.7
13					8.15	7.15	6.05	5.4	5.1	6.75	6.9	8.5
14				9.0	7.85	6.9	6.0	5.35	5.05	6.55	6.6	8.6
15					7.25	6.55	6.0	5.2	4.9	6.4	6.5	8.35
16					7.05	6.3	5.9	5.1	4.8	6.3	6.5	7.9
17			6.2	9.1	6.8	5.85	5.9	5.0	4.7	6.05	6.4	7.45
18				8.85	6.7	5.35	5.9	4.85	4.6	5.85	6.3	7.15
19				7.9	6.6	5.3	5.8	4.75	4.6	5.7	6.05	6.7
20	6.4			8.15	6.55	5.15	5.7	4.7	4.6	5.55	5.85	6.4
21				8.2	6.7	5.1	5.7	4.7	4.6	5.4	5.65	6.4
22				8.65	6.85	5.0	5.9	4.6	4.55	5.3	5.5	6.3
23				9.1	6.9	4.9	5.9	4.6	4.4	5.15	5.5	6.1
24			6.6	9.35	6.5	5.0	5.9	4.5	4.4	5.1	5.6	6.0
25				9.95	6.05	5.25	5.8	4.55	4.7	5.0	5.6	6.2
26		5.8	6.4	11.05	5.9	5.55	5.8	4.6	5.15	4.9	5.6	6.4
27	6.5			11.6	5.85	5.9	5.7	4.6	5.6	4.95	5.9	6.5
28				12.15	6.25	6.75	5.8	4.55	5.2	5.45	5.8	6.45
29				12.5	6.4	7.85	5.8	4.4	4.85	5.6	5.8	6.3
30				13.05	6.3	8.35	5.8	4.3	4.8	5.7	5.8	6.15
31			7.0		6.15		6.0	4.4		5.7		6.0
1908.[b]												
1	6.0		8.5		11.2	7.35	4.25	3.35	3.1	2.65	4.8	4.6
2	6.0				11.55	8.5	4.15	3.35	3.0	3.05	5.15	4.7
3	6.0	8.0			11.5		4.05	3.25	3.1	3.7	4.9	4.9
4	6.0				11.35		3.95	3.15	3.1	4.3	4.45	5.0
5	6.0				11.1	8.45	3.95	3.05	3.1	4.4	4.4	4.75
6	6.0				10.65	7.85	3.85	3.15	3.1	4.3	4.4	4.8
7	6.0		7.8		10.2	7.3	3.75	3.3	3.2	4.0	4.3	4.8
8	6.0			9.05	9.85	6.9	3.75	3.5	3.4	3.9	4.2	4.9
9	6.3			9.2	9.7	6.7	3.75	3.6	3.5	3.75	4.1	5.15
10	6.5	7.5		9.1	9.75	6.45	3.75	3.7	3.5	3.6	4.1	5.3
11	6.8			9.1	9.9	6.45	3.75	3.8	3.4	3.6	4.1	5.3
12	6.8				9.9	6.3	3.65	3.8	3.4	3.7	4.0	5.4
13	6.7				9.65	6.15	3.55	3.9	3.3	3.7	4.1	5.4
14	6.6				9.3	5.95	3.55	3.75	3.2	3.7	4.2	5.4
15			7.3	6.7	9.05	5.4	3.45	3.45	3.0	3.6	4.25	5.4
16		8.5		6.9	8.9	5.4	3.45	3.75	2.9	3.6	4.45	5.4
17		8.5		7.0	8.75	5.95	3.45	3.8	2.9	3.5	4.55	5.5
18				7.05	8.45	6.05	3.45	3.95	2.8	3.4	4.4	5.6
19				7.0	7.95	5.95	3.55	4.0	2.8	3.3	4.3	5.6
20	8.0		8.6	6.9	7.65	5.95	3.55	4.1	2.8	3.2	4.2	5.1
21			8.5	6.8	7.25	5.85	3.55	4.1	2.7	3.1	4.1	
22			8.3	6.8	6.75	5.7	3.55	4.0	2.7	3.1	4.1	
23		8.5		6.9	6.6	5.4	3.55	3.9	2.6	3.0	4.0	5.4
24				7.0	6.4	5.4	3.6	3.8	2.5	2.9	4.2	
25				7.55	6.2	5.2	3.65	3.7	2.5	2.8	4.1	
26	8.0			8.15	5.95	5.05	3.55	3.6	2.5	2.95	3.9	
27				9.05	5.8	4.95	3.45	3.5	2.5	3.3	4.05	5.0
28				9.7	5.95	4.6	3.35	3.5	2.5	3.4	4.2	
29				9.85	5.95	4.25	3.35	3.4	2.5	3.55	4.3	
30				10.45	5.95	4.15	3.35	3.3	2.6	3.8	4.4	
31					6.35		3.35	3.2		4.35		

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[a] River frozen Jan. 1 to Apr. 18, 1907. During the frozen season gage heights were taken to water surface in a hole cut in the ice. June 14, 1907, all logs out of the river.

[b] River frozen from about Jan. 5 to Apr. 7, and from about Dec. 1 to 31, 1908. During the frozen season gage heights were taken to water surface in a hole cut in the ice. Gage heights affected by log jams from about June 2 to 14, 1908.

Daily gage height, in feet, of Mattawamkeag River at Mattawamkeag, 1902–1909—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.[a]												
1					9.45	6.15	4.6	4.3	3.8	9.9	4.85	7.3
2					9.35	5.85	4.6	4.15	3.8	10.0	5.1	7.05
3	4.2				9.1	5.8	4.6	4.0	3.75	9.85	5.45	6.75
4				11.3	9.1	5.7	4.5	4.0	3.6	9.4	5.75	6.7
5					9.35	5.6	4.4	4.0	3.65	9.05	6.05	6.8
6					9.5	5.55	4.3	3.9	3.8	8.6	6.4	7.0
7		6.9	9.1		9.6	5.5	4.3	3.8	3.8	8.05	6.5	6.9
8					9.45	5.5	4.45	3.8	4.1	7.4	6.45	6.85
9					9.45	5.5	4.7	3.8	4.2	6.95	6.2	6.45
10	8.3				9.7	5.5	4.85	3.65	4.35	6.55	6.3	6.15
11				9.65	9.8	5.5	5.0	3.5	4.1	6.1	6.1	5.85
12				9.05	9.95	5.5	5.1	3.5	4.2	6.0	5.7	5.7
13				8.9	10.2	4.85	5.0	3.6	4.3	5.85	5.45	5.6
14		7.1	7.8	9.4	10.2	4.55	4.9	3.55	4.45	5.65	5.55	5.6
15				11.2	10.2	4.5	4.9	3.5	4.7	5.5	5.8	5.5
16				12.3	10.2	4.5	4.9	3.4	4.9	5.4	5.7	5.5
17	7.0			12.65	10.15	4.4	4.9	3.4	4.9	5.4	5.7	5.6
18				12.7	9.85	4.5	4.9	3.55	4.9	5.4	5.7	5.6
19				12.75	9.75	4.65	5.0	3.75	4.65	5.3	5.7	5.6
20				12.8	9.45	5.05	5.0	3.8	4.5	5.3	5.6	5.6
21		7.2	7.4	12.8	9.2	4.8	5.1	3.9	4.3	5.2	5.5	5.6
22				12.6	8.6	4.7	5.2	3.9	4.2	5.1	5.4	5.7
23				12.5	8.2	4.6	5.3	3.9	4.2	5.1	5.3	5.7
24	6.3			12.25	7.95	4.55	5.3	3.9	4.1	5.1	5.45	5.8
25				11.9	7.8	4.4	5.15	4.0	4.0	5.1	5.8	5.8
26				11.5	7.55	4.3	5.0	4.1	4.0	5.2	6.8	5.9
27				11.05	7.0	4.15	4.9	4.0	4.55	5.3	7.9	5.8
28		8.9	8.4	10.65	6.65	4.0	4.8	4.0	6.35	5.3	8.25	
29				10.25	6.45	3.95	4.7	3.95	9.0	5.2	7.95	
30				9.8	6.3	4.25	4.55	3.8	10.15	5.1	7.55	
31	6.2				6.3		4.4	3.7		5.0		

[a] Gage heights affected by ice Jan. 1 to Apr. 10, and Dec. 28 to 31, 1909. Gage heights are to water surface during periods of ice cover except Mar. 28 and Apr. 4, which are to top of ice. Anchor ice was running Dec. 1 and 12. Logs cleared the bridge June 13.

Rating table for Mattawamkeag River at Mattawamkeag, 1902–1909.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
2.50	86	3.90	590	5.30	2,080	7.40	5,920
2.60	100	4.00	660	5.40	2,220	7.60	6,360
2.70	114	4.10	736	5.50	2,360	7.80	6,810
2.80	134	4.20	818	5.60	2.500	8.00	7,270
2.90	160	4.30	906	5.70	2,660	8.20	7,750
3.00	190	4.40	1,000	5.80	2,820	8.40	8,230
3.10	223	4.50	1,100	5.90	2,980	8.60	8,730
3.20	258	4.60	1,210	6.00	3,160	8.80	9,230
3.30	295	4.70	1,320	6.20	3,520	9.00	9,750
3.40	334	4.80	1,440	6.40	3,900	10.00	12,520
3.50	375	4.90	1,560	6.60	4,280	11.00	15,570
3.60	420	5.00	1,690	6.80	4,680	12.00	18,620
3.70	470	5.10	1,820	7.00	5,080	13.00	21,670
3.80	525	5.20	1,950	7.20	5,490	14.00	24,720

NOTE.—The above table supersedes all ratings previously published for this station. It is not applicable for ice or obstructed channel conditions. It is based on 27 discharge measurements made during 1902 to 1909 and is well defined below gage height 12 feet.

Daily discharge, in second-feet, of Mattawamkeag River at Mattawamkeag, 1902–1909.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.						1902.					
1	......	736	1,210	6,920	2,580	16	......	1,690	1,440	2,220	......
2	......	698	1,210	5,920	2,290	17	......	1,690	1,440	2,360	5,080
3	......	1,000	1,210	5,080	2,290	18	......	1,560	1,440	2,360	6,030
4	......	1,320	1,150	4,380	2,020	19	......	1,500	1,440	2,360	6,810
5	......	1,210	1,000	3,800	2,150	20	......	1,320	1,500	2,360	......
6	......	1,210	1,050	3,340	2,080	21	......	1,100	1,750	2,220	......
7	......	1,100	1,380	3,160	2,150	22	......	1,000	1,950	2,360	......
8	......	1,000	2,020	2,980	5,600	23	......	1,000	1,880	2,360	......
9	......	906	2,290	2,740	5,180	24	......	1,000	1,690	2,360	......
10	......	1,050	2,220	2,580	4,480	25	......	953	1,500	2,360	......
11	......	1,100	1,950	2,290	4,000	26	1,210	1,000	1,320	2,290	......
12	......	1,210	1,820	2,080	3,900	27	1,320	1,000	1,260	2,150	......
13	......	1,320	1,620	2,020	......	28	1,210	862	1,750	2,220	......
14	......	1,440	1,560	1,950	......	29	1,100	906	4,680	2,430	......
15	......	1,440	1,440	2,080	......	30	1,000	953	6,810	2,660	......
						31	862	......	7,280	......	......

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	......	......	......	11,500	5,600	660	1,150	1,210	375	258	375	818
2	......	......	......	10,700	5,080	625	1,100	1,050	334	258	375	736
3	......	......	......	9,880	4,680	660	1,000	862	375	258	375	660
4	......	......	......	10,100	4,480	625	1,000	660	375	258	375	590
5	......	......	......	10,100	4,580	660	953	660	375	228	420	590
6	......	......	......	9,750	4,380	660	818	660	375	160	470	660
7	......	......	......	9,880	4,480	625	862	590	375	160	525	736
8	......	......	......	9,880	4,780	660	1,000	590	334	190	525	736
9	......	......	......	10,900	4,480	590	1,000	525	334	190	590	736
10	......	......	12,700	12,200	3,900	736	862	470	375	134	698	736
11	......	......	18,300	12,800	3,800	736	625	420	375	134	736	736
12	......	......	20,700	12,500	3,520	906	525	525	334	134	777	736
13	......	......	21,300	12,100	3,430	1,210	445	525	295	114	953	818
14	......	......	13,400	11,400	3,900	1,150	420	525	295	114	1,210	1,210
15	......	......	14,000	10,900	3,430	1,150	498	525	258	114	1,440	1,320
16	......	......	13,300	10,000	2,820	1,150	625	525	258	114	1,440	1,440
17	......	......	13,100	9,750	2,080	1,210	953	470	334	114	1,320	1,560
18	......	......	13,000	9,360	1,950	1,050	1,320	420	375	134	1,320	......
19	......	......	12,500	8,730	1,820	906	1,320	525	375	190	1,320	......
20	......	......	12,500	8,360	1,880	818	1,260	590	375	276	1,320	......
21	......	......	12,500	7,040	1,950	818	1,100	660	334	334	1,000	......
22	......	......	12,500	5,920	1,950	777	1,100	660	295	334	1,000	......
23	......	......	13,100	5,500	1,950	660	1,100	736	258	334	906	......
24	......	......	14,300	5,280	1,950	660	1,210	736	295	334	818	......
25	......	......	16,300	5,390	1,620	660	1,210	736	395	334	1,100	......
26	......	......	16,300	5,600	1,560	660	1,210	660	295	334	1,210	......
27	......	......	16,000	6,140	1,620	660	1,050	590	295	375	1,100	......
28	......	......	15,600	6,250	1,500	660	862	525	295	470	1,000	......
29	......	......	14,900	6,030	1,380	660	818	470	295	420	1,000	......
30	......	......	13,400	5,700	1,150	953	736	470	258	375	906	......
31	......	......	12,400	......	862	......	953	420	......	334	......	......
1904.												
1	......	......	......	......	14,600	3,900	1,100	498	375	3,340	2,220	1,950
2	......	......	......	......	15,600	3,710	1,100	375	334	4,000	2,080	1,820
3	......	......	......	......	15,900	3,520	1,380	445	354	4,280	1,950	1,690
4	......	......	......	......	15,600	3,520	1,560	470	420	4,000	1,620	1,820
5	......	......	......	......	14,800	3,620	1,560	470	498	3,620	1,500	1,950
6	......	......	......	......	13,700	4,090	1,560	470	736	3,250	1,880	2,080
7	......	......	......	......	12,800	4,980	1,560	470	1,000	2,900	1,880	2,360
8	......	......	......	7,750	12,400	5,180	1,500	398	906	2,580	1,820	2,820
9	......	......	......	6,360	10,900	4,680	1,320	334	818	2,290	1,820	2,820
10	......	......	......	7,750	10,800	4,480	1,320	398	698	2,080	1,750	2,660
11	......	......	......	9,750	10,100	4,280	906	470	660	2,080	1,560	2,660
12	......	......	......	11,800	11,500	4,090	818	525	590	1,950	1,440	2,660
13	......	......	......	12,400	15,100	3,520	906	525	590	1,820	1,440	2,660
14	......	......	......	12,700	16,800	3,340	906	525	525	2,020	1,380	2,500
15	......	......	......	12,200	17,700	3,250	1,000	498	862	2,220	1,260	2,360

Daily discharge, in second-feet, of Mattawamkeag River at Mattawamkeag, 1902–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
16	......	......	......	11,500	17,300	3,160	1,100	398	1,150	2,220	1,000	2,220
17	......	......	......	11,100	16,500	3,160	1,050	420	1,560	2,080	1,000	2,080
18	......	......	......	10,000	14,800	3,160	953	525	1,750	1,950	1,150	1,950
19	......	......	......	9,490	11,500	3,160	736	590	1,690	1,950	1,440	1,820
20	......	......	......	9,240	10,700	2,900	818	590	1,820	1,820	1,820	1,690
21	......	......	......	8,980	10,700	2,290	736	660	1,950	1,690	1,440	......
22	......	......	......	8,980	9,110	1,880	698	660	1,820	1,880	1,320	......
23	......	......	......	8,980	8,730	1,620	660	660	1,950	2,290	1,380	......
24	......	......	......	9,110	8,600	1,440	590	660	1,950	2,360	1,690	......
25	......	......	......	9,880	8,110	1,260	557	660	2,150	2,500	1,620	......
26	......	......	......	10,700	6,810	1,050	420	660	2,580	2,740	1,880	......
27	......	......	......	11,200	6,250	953	470	557	2,820	2,980	2,080	......
28	......	......	......	11,800	6,140	1,050	525	470	2,820	2,980	1,950	......
29	......	......	......	12,400	5,500	1,210	525	470	2,660	3,160	1,950	......
30	......	......	......	13,400	4,580	1,210	590	445	2,740	2,900	1,950	......
31	......	......	......	......	4,090	......	590	445	......	2,580	......	......
1905.												
1	......	......	......	......	4,880	2,080	818	375	134	114	100	1,560
2	......	......	......	16,800	4,680	2,080	818	375	134	100	114	1,560
3	......	......	......	9,360	4,480	2,080	818	375	134	100	114	1,320
4	......	......	......	8,730	4,480	1,950	818	354	134	86	334	1,440
5	......	......	......	8,360	4,380	1,950	818	295	160	86	375	1,560
6	......	......	......	8,860	4,090	1,950	818	295	223	86	420	1,750
7	......	......	......	10,300	3,710	1,950	818	295	223	86	420	1,690
8	......	......	......	11,900	3,520	1,820	818	258	258	86	420	1,560
9	......	......	......	12,500	3,340	1,820	818	258	258	86	420	1,440
10	......	......	......	12,500	3,340	1,620	818	276	258	86	420	1,260
11	......	......	......	12,200	3,340	1,500	736	334	223	86	470	1,100
12	......	......	......	11,400	3,430	1,320	736	334	190	86	470	1,000
13	......	......	......	10,900	3,340	1,260	660	334	190	100	470	1,000
14	......	......	......	10,500	3,070	1,440	660	276	258	100	470	1,150
15	......	......	......	10,500	2,580	1,620	590	223	334	100	420	1,440
16	......	......	......	10,500	2,580	1,950	590	223	314	100	420	1,560
17	......	......	......	10,100	2,980	2,430	525	190	295	86	470	......
18	......	......	......	9,240	3,340	2,020	470	258	258	86	625	......
19	......	......	......	8,240	4,090	2,150	470	258	258	100	862	......
20	......	......	......	7,630	4,580	2,660	470	258	295	100	1,210	......
21	......	......	......	7,040	5,810	2,500	470	240	258	114	906	......
22	......	......	......	7,040	5,500	1,820	470	190	258	114	698	......
23	......	......	......	7,280	5,500	1,620	470	160	223	114	590	......
24	......	......	......	7,280	5,700	1,380	398	147	190	114	590	......
25	......	......	......	7,280	5,390	1,150	334	190	175	114	660	......
26	......	......	......	7,040	4,680	1,000	420	223	134	114	660	......
27	......	......	......	6,580	4,000	906	470	190	134	114	660	......
28	......	......	......	5,810	3,160	1,000	420	160	114	100	660	......
29	......	......	......	5,280	2,500	906	354	160	114	100	777	......
30	......	......	......	5,080	2,290	906	375	114	114	100	1000	......
31	......	......	......	......	2,080	......	375	134	......	100	......	......
1906.												
1	......	8,980	......	......	13,700	5,500	1,050	420	314	114	3,520	2,220
2	......	8,230	......	......	14,300	5,180	818	525	276	100	3,340	2,290
3	......	7,270	......	......	14,600	4,480	660	525	258	100	3,160	2,360
4	......	......	......	......	14,900	4,680	818	498	295	100	3,160	......
5	......	......	......	......	15,800	5,810	1,100	470	420	100	3,340	......
6	......	......	......	......	15,900	5,280	953	470	420	86	3,520	......
7	......	......	......	......	15,900	4,880	1,000	470	470	114	3,250	......
8	......	......	......	......	15,900	4,480	862	445	420	190	2,980	......
9	......	......	......	......	15,300	4,280	625	420	375	295	2,820	......
10	......	......	......	......	14,600	3,520	818	354	375	445	2,900	......
11	......	......	......	......	14,600	2,820	736	334	334	1,000	3,160	......
12	......	......	......	......	13,700	2,220	818	334	334	2,740	3,160	......
13	......	......	......	......	12,800	1,560	906	334	258	3,160	2,980	......
14	......	......	......	......	12,200	1,210	1,000	314	223	3,160	2,820	......
15	......	......	......	......	12,400	1,050	1,100	295	190	2,980	2,820	......
16	......	......	......	......	11,200	906	1,000	295	190	2,820	2,820	......
17	......	......	......	11,400	10,400	736	906	295	134	2,580	2,980	......
18	......	......	......	11,800	9,490	590	906	295	100	2,290	2,980	......
19	......	......	......	12,800	9,240	525	818	295	86	1,950	3,160	......
20	......	......	......	14,200	7,870	698	818	258	100	1,500	3,520	......

Daily discharge, in second-feet, of Mattawamkeag River at Mattawamkeag, 1902–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
21	......	......	......	14,500	6,140	1,260	1,100	223	100	1,440	3,710	......
22	......	......	......	14,600	5,500	1,750	818	206	100	1,320	3,710	......
23	......	......	......	14,600	5,180	2,360	818	240	107	1,440	3,520	......
24	......	......	......	14,800	5,920	2,500	818	258	114	1,690	3,340	......
25	17,400	......	......	14,900	5,500	2,500	818	258	114	1,820	3,160	......
26	17,400	......	......	14,300	4,190	2,500	818	258	114	2,430	2,820	......
27	16,800	......	......	14,300	4,090	1,950	818	258	114	3,070	2,660	......
28	15,800	......	......	13,700	3,900	1,560	736	295	114	3,430	2,660	......
29	15,600	......	......	13,700	4,000	1,440	736	334	114	3,710	2,360	......
30	14,800	......	......	13,400	4,680	1,150	557	354	114	3,520	2,080	......
31	9,750	......	......	......	4,680	......	470	375	......	3,520	......	......
1907.												
1	......	......	......	......	23,800	2,740	8,480	4,000	862	1,440	2,500	2,820
2	......	......	......	......	24,400	2,740	8,730	4,580	625	1,440	2,500	2,820
3	......	......	......	......	23,500	3,250	8,730	4,680	525	1,320	2,580	2,980
4	......	......	......	......	[a]21,300	4,190	8,480	4,380	590	1,210	3,250	3,160
5	......	......	......	......	[a]19,000	4,280	7,510	4,090	1,210	1,100	3,520	3,340
6	......	......	......	......	[a]16,800	4,780	6,920	4,090	1,690	1,150	3,620	3,520
7	......	......	......	......	14,500	5,180	5,920	4,280	2,430	1,380	4,280	3,710
8	......	......	......	......	13,400	5,500	5,180	4,090	2,580	1,880	5,700	3,710
9	......	......	......	......	11,900	6,700	4,780	3,710	2,290	2,820	6,470	3,710
10	......	......	......	......	10,300	6,700	4,380	3,250	2,080	4,000	6,810	3,900
11	......	......	......	......	9,110	6,250	3,900	2,740	1,880	4,780	6,360	4,480
12	......	......	......	......	8,110	5,810	3,520	2,430	1,690	5,080	5,600	6,580
13	......	......	......	......	7,630	5,390	3,250	2,220	1,820	4,580	4,830	8,480
14	......	......	......	......	6,920	4,880	3,160	2,150	1,750	4,190	4,230	8,730
15	......	......	......	......	5,600	4,190	3,160	1,950	1,560	3,900	4,090	8,110
16	......	......	......	......	5,180	3,710	2,980	1,820	1,440	3,710	4,090	7,040
17	......	......	......	......	4,680	2,900	2,980	1,690	1,320	3,250	3,900	6,030
18	......	......	......	......	4,480	2,150	2,980	1,500	1,210	2,900	3,710	5,390
19	......	......	......	7,040	4,280	2,080	2,820	1,380	1,210	2,660	3,250	4,480
20	......	......	......	7,630	4,190	1,880	2,660	1,320	1,210	2,430	2,900	3,900
21	......	......	......	7,750	4,480	1,820	2,980	1,320	1,210	2,220	2,580	3,900
22	......	......	......	8,860	4,780	1,690	2,980	1,210	1,150	2,080	2,360	3,710
23	......	......	......	10,000	4,880	1,560	2,980	1,210	1,000	1,880	2,360	3,340
24	......	......	......	10,700	4,090	1,690	2,980	1,100	1,000	1,820	2,500	3,160
25	......	......	......	12,400	3,250	2,020	2,820	1,150	1,320	1,690	2,500	3,520
26	......	......	......	15,800	2,980	2,430	2,820	1,210	1,880	1,560	2,500	3,900
27	......	......	......	17,400	2,900	2,980	2,660	1,210	2,500	1,620	2,980	4,090
28	......	......	......	19,100	3,620	4,580	2,820	1,150	1,950	2,290	2,820	4,000
29	......	......	......	20,100	3,900	6,920	2,820	1,000	1,500	2,500	2,820	3,710
30	......	......	......	21,900	3,710	8,110	2,820	906	1,440	2,660	2,820	3,430
31	......	......	......	......	3,430	......	3,160	1,000	......	2,660	......	3,160
1908.												
1	......	......	......	......	16,200	5,810	862	314	223	107	1,440	......
2	......	......	......	......	17,200	8,000	777	314	190	206	1,880	......
3	......	......	......	......	17,100	7,500	698	276	223	470	1,560	......
4	......	......	......	......	16,600	7,000	625	240	223	906	1,050	......
5	......	......	......	......	15,900	6,500	625	206	223	1,000	1,000	......
6	......	......	......	......	14,500	6,000	558	240	223	906	1,000	......
7	......	......	......	......	13,100	5,000	498	295	258	660	906	......
8	......	......	......	9,880	12,100	4,500	498	375	334	590	818	......
9	......	......	......	10,300	11,700	4,000	498	420	375	498	736	......
10	......	......	......	10,000	11,800	3,500	498	470	375	420	736	......
11	......	......	......	10,000	12,200	3,500	498	525	334	420	736	......
12	......	......	......	[b]8,000	12,200	3,000	445	525	334	470	660	......
13	......	......	......	6,000	11,500	3,000	398	590	295	470	736	......
14	......	......	......	5,000	10,500	2,500	398	498	258	470	818	......
15	......	......	......	4,480	9,880	2,220	354	354	190	420	862	......
16	......	......	......	4,880	9,490	2,220	354	498	160	420	1,050	......
17	......	......	......	5,080	9,100	3,070	354	525	160	375	1,160	......
18	......	......	......	5,180	8,360	3,250	354	625	134	334	1,000	......
19	......	......	......	5,080	7,160	3,070	398	660	134	295	906	......
20	......	......	......	4,880	6,470	3,070	398	736	134	258	818	......

[a] Record missing. Discharge interpolated.

[b] Discharge estimated for Apr. 12 to 14, when there was no record. Also estimated for June 2 to 14, when logs were running and jammed under gage.

Daily discharge, in second-feet, of Mattawamkeag River at Mattawamkeag, 1902–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
21	......	......	......	4,680	5,600	2,900	398	736	114	223	736	......
22	......	......	......	4,680	4,580	2,660	398	660	114	223	736	......
23	......	......	......	4,880	4,280	2,220	398	590	100	190	660	......
24	......	......	......	5,080	3,900	2,220	420	525	86	160	818	......
25	......	......	......	6,250	3,520	1,950	445	470	86	134	736	......
26	......	......	......	7,630	3,070	1,760	398	420	86	175	590	......
27	......	......	......	9,880	2,820	1,620	354	375	86	295	698	......
28	......	......	......	11,700	3,070	1,210	314	375	86	334	818	......
29	......	......	......	12,100	3,070	862	314	334	86	398	906	......
30	......	......	......	13,900	3,070	777	314	295	100	525	1,000	......
31	......	......	......	......	3,800	......	314	258	......	953	......	......
1909.												
1	......	......	......	......	11,000	3,430	1,210	906	525	12,230	1,500	5,700
2	......	......	......	......	10,700	2.900	1,210	777	525	12,500	1,820	5,180
3	......	......	......	......	10,000	2,820	1,210	660	498	12,100	2,290	4,580
4	......	......	......	......	10,000	2,660	1,100	660	420	10,800	2,740	4,480
5	......	......	......	......	10,700	2,500	1,000	660	445	9,880	3,250	4,680
6	......	......	......	......	11,100	2,430	906	590	525	8,730	3,900	5,080
7	......	......	......	......	11,400	2,360	906	525	525	7,390	4,090	4,880
8	......	......	......	......	11,000	2,360	1,050	525	736	5,920	4,000	4,780
9	......	......	......	......	11,000	2,360	1,320	525	818	4,980	3,520	4,000
10	......	......	......	......	11,700	2,360	1,500	445	953	4,180	3,710	3,430
11	......	......	......	......	11,900	2,360	1,690	375	736	3,340	3,340	2,900
12	......	......	......	9,880	12,400	2,360	1,820	375	818	3,160	2,660	2,660
13	......	......	......	9,490	13,100	[a]1,500	1,690	420	906	2,900	2,290	2,500
14	......	......	......	10,800	13,100	1,160	1,560	398	1,050	2,580	2,430	2,500
15	......	......	......	16,200	13,100.	1,100	1,560	375	1,320	2,360	2,820	2,360
16	......	......	......	19,500	13,100	1,100	1,560	334	1,560	2,220	2,660	2,360
17	......	......	......	20,600	13,000	1,000	1,560	334	1,560	2,220	2,660	......
18	......	......	......	20,800	12,100	1,100	1,560	398	1,560	2,220	2,660	......
19	......	......	......	20,900	11,800	1,260	1,690	498	1,260	2,080	2,660	......
20	......	......	......	21,100	11,000	1,760	1,690	525	1,100	2,080	2,500	......
21	......	......	......	21,100	10,300	1,440	1,820	590	906	1,950	2,360	......
22	......	......	......	20,400	8,730	1,320	1,950	590	818	1,820	2,220	......
23	......	......	......	20,100	7,750	1,210	2,080	590	818	1,820	2,080	......
24	......	......	......	19,400	7,160	1,160	2,080	590	736	1,820	2,290	......
25	......	......	......	18,300	6,810	1,000	1,880	660	660	1,820	2,820	......
26	......	......	......	17,100	6,250	906	1,690	736	660	1,950	4,680	......
27	......	......	......	15,700	5,080	777	1,560	660	1,160	2,080	7,040	......
28	......	......	......	14,500	4,380	660	1,440	660	3,800	2,080	7,870	......
29	......	......	......	13,300	4,000	625	1,320	625	9,750	1,950	7,160	......
30	......	......	......	11,900	3,710	862	1,160	525	13,000	1,820	6,250	......
31	......	......	......	......	3,710	......	1,000	470	......	1,690	......	......

[a] Discharge probably affected by logging for some days previous to June 13.

Monthly discharge of Mattawamkeag River at Mattawamkeag, 1902–1909.

[Drainage area, 1,500 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1902.						
Aug. 26–31	1,320	862	1,120	0.747	0.17	A.
September	1,690	698	1,140	.760	.85	A.
October	7,280	1,000	2,010	1.34	1.54	A.
November	6,920	1,950	2,880	1.92	2.14	A.
December (15 days)	6,810	2,020	3,780	2.52	1.41	B.
1903.						
Mar. 10–31	21,300	12,400	14,660	9.73	7.96	A.
April	12,800	5,280	8,990	5.99	6.68	A.
May	5,600	862	2,990	1.99	2.29	A.
June	1,210	590	798	.532	.59	A.
July	1,320	420	938	.625	.72	A.
August	1,210	420	613	.409	.47	A.
September	375	258	327	.218	.24	A.
October	470	114	242	.161	.19	A.
November	1,440	375	887	.591	.66	A.
Dec. 1–17	1,560	590	872	.581	.37	A.
1904.						
Apr. 8–30	13,400	6,360	10,300	6.87	5.88	A.
May	17,700	4,090	11,500	7.67	8.84	A.
June	5,180	953	2,990	1.99	2.22	A.
July	1,560	420	952	.635	.73	A.
August	660	334	508	.339	.39	A.
September	2,820	334	1,360	.907	1.01	A.
October	4,280	1,690	2,600	1.73	1.99	A.
November	2,220	1,000	1,640	1.09	1.22	A.
Dec. 1–20	2,820	1,690	2,230	1.49	1.11	A.
1905.						
Apr. 2–30	16,800	5,080	9,180	6.12	6.60	B.
May	5,810	2,080	3,900	2.60	3.00	A.
June	2,660	906	1,690	1.13	1.26	A.
July	818	334	601	.401	.46	A.
August	375	114	250	.167	.19	A.
September	334	114	208	.139	.16	A.
October	114	86	98.7	.0658	.08	B.
November	1,210	100	541	.361	.40	A.
Dec. 1–16	1,750	1,000	1,400	.933	.56	B.
1906.[a]						
Apr. 17–30	14,900	11,400	13,800	9.20	4.79	B.
May	15,900	3,900	10,300	6.87	7.92	B.
June	5,810	525	2,650	1.77	1.98	A.
July	1,100	470	846	.564	.65	A.
August	525	206	345	.230	.26	A.
September	470	86	224	.149	.17	A.
October	3,710	86	1,720	1.15	1.33	A.
November	3,710	2,080	3,080	2.05	2.29	A.
1907.[b]						
January	1,850	880	1,330	.887	1.02	D.
February	1,000	480	740	.493	.51	D.
March	1,290	470	694	.463	.53	B.
April	21,900	1,290	6,690	4.46	4.98	A.
May	24,400	2,900	9,070	6.05	6.98	A.
June	8,110	1,560	3,970	2.65	2.96	A.
July	8,730	2,660	4,260	2.84	3.27	A.
August	4,680	906	2,350	1.57	1.81	A.
September	2,580	525	1,500	1.00	1.12	A.
October	5,080	1,100	2,520	1.68	1.94	A.
November	6,810	2,360	3,680	2.45	2.73	A.
December	8,730	2,820	4,410	2.94	3.39	A.
The year	24,400	470	3,430	2.29	31.24	

[a] An estimate of 6,440 second-feet per day for Apr. 1 to 16 gives a monthly mean of 9,870 second-feet. A monthly mean of 1,740 second-feet has been estimated for December.

[b] Discharge during the frozen period 1907 determined from an approximate ice rating. Discharge May 4 to 6, 1907, interpolated. Discharge Apr. 1 to 18, 1907, 2,330 second-feet. Discharge probably not affected by ice conditions during December, 1907.

Monthly discharge of Mattawamkeag River at Mattawamkeag, 1902–1909—Continued.

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1908.[a]						
January			2,980	1.99	2.29	D.
February			2,510	1.67	1.80	D.
March			2,280	1.52	1.75	D.
April	13,900		6,780	4.52	5.04	C.
May	17,200	2,820	9,160	6.11	7.04	A.
June	8,000	777	3,500	2.33	2.60	B.
July	862	314	457	.305	.35	A.
August	736	206	443	.295	.34	A.
September	375	86	191	.127	.14	A.
October	1,000	107	429	.286	.33	A.
November	1,880	590	919	.613	.68	A.
December	1,100	400	722	.481	.55	B.
The year	17,200	86	2,530	1.69	22.91	
1909.[b]						
January			928	.619	.71	D.
February			888	.592	.62	D.
March			1,910	1.27	1.46	D.
April	21,100		12,400	8.27	9.23	C.
May	13,100	3,710	9,710	6.47	7.46	A.
June	3,430	625	1,690	1.13	1.26	B.
July	2,080	906	1,408	.987	1.14	A.
August	906	334	548	.365	.42	A.
September	13,000	420	1,670	1.11	1.24	A.
October	12,500	1,690	4,340	2.89	3.33	A.
November	7,870	1,500	3,410	2.27	2.53	A.
December	5,700		3,310	2.21	2.55	B.
The year	21,100	334	3,490	2.33	31.56	

[a] Discharge during the frozen periods 1908 based on the 1907 ice rating climatological reports and on four discharge measurements made under ice conditions. Discharge Apr. 12 to 14 and June 2 to 14, estimated.

	Second-feet.
Discharge Apr. 1 to 14, 1908	6,660
Discharge June 2 to 14, 1908	4,920

[b] Discharge for frozen periods estimated by study of climatologic data and comparisons with other stations.

	Second-feet.
Mean discharge, Apr. 1 to 11, estimated	4,730
Mean discharge, Dec. 17 to 31, estimated	1,670

PISCATAQUIS RIVER NEAR FOXCROFT.

Piscataquis River rises in the hilly and mountainous region south and east of Moosehead Lake, flows for about 50 miles in an easterly direction, and enters the Penobscot at Howland. Its slopes and valleys are generally steep, and the regimen of flow is therefore variable. Sebec, Schoodic, and Seboois streams, all outlets of large lakes having the same names, are the principal tributaries.

The gaging station, which was established August 17, 1902, is located at Low's bridge, about halfway between the villages of Guilford and Foxcroft, and is just above the mouths of Black and Salmon streams. Water power is used at several manufacturing plants within a few miles above the station, and the river fluctuates considerably at the gage during low stages. The little storage on the river above this point is used solely for log driving.

The gage datum has remained the same during the maintenance of the station. During the winter the discharge is affected by ice. Conditions for obtaining accurate discharge data are good, and a very good rating curve has been developed for medium stages. At high and low stages the curve is not yet accurately defined.

Discharge measurements of Piscataquis River near Foxcroft, 1902–1906 and 1908–9.

Date.	Gage height.	Discharge.
1902.	*Feet.*	*Second-feet.*
Aug. 13	3.70	1,000
Aug. 16	2.80	332
Sept. 10	2.75	288
Oct. 18	2.00	61
1903.		
Apr. 6	4.30	1,490
May 14	2.80	370
Do	2.79	368
June 12	2.48	160
Do	2.64	208
Do	2.47	169
Sept. 16	2.19	112
Oct. 3[a]	1.52	22
Oct. 31[a]	1.78	31
Do	1.94	79
Do	1.78	37
Nov. 24[a]	2.50	181
1904.	*Feet.*	*Second-feet.*
Apr. 22	4.00	1,190
May 13	5.92	3,850
Do	5.98	3,910
June 2	2.90	415
1905.		
Apr. 15	5.35	2,880
June 20	3.04	425
1906.		
Aug. 22	2.73	320
Aug. 31	2.81	330
1908.		
Apr. 6	3.19	550
Oct. 30	2.69	269
1909.		
Oct. 28	3.14	499

[a] Measurement by wading.

Daily gage height, in feet, of Piscataquis River near Foxcroft, 1902–1909.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.					
1		2.45	2.65	3.9	3.05
2		2.35	2.65	3.55	3.0
3		2.4	2.55	3.5	2.9
4		2.4	2.45	3.5	2.8
5		2.5	2.4	3.3	2.7
6		2.4	2.3	3.35	(a)
7		2.35	2.9	3.1	
8		2.55	3.15	3.15	
9		2.55	3.1	3.0	
10		3.3	2.95	3.1	
11		3.6	2.75	2.9	
12		3.25	2.5	3.25	
13		2.45	2.7	3.85	
14		2.7	2.35	3.5	
15		2.95	2.1	3.4	
16		3.15	2.15	3.3	
1902.					
17	2.45	3.15	2.6	3.5	(a)
18	2.75	2.85	2.25	3.35	
19	2.55	2.75	2.0	3.05	
20	2.5	2.75	2.9	3.25	
21	2.85	2.7	3.35	3.25	
22	2.65	2.65	3.1	3.15	
23	2.4	2.55	2.95	3.05	
24	2.35	2.7	2.95	3.05	
25	2.65	2.6	2.9	3.0	
26	2.7	2.6	2.7	3.0	
27	2.75	2.55	2.75	2.8	
28	2.7	2.2	4.0	3.05	
29	2.5	2.35	6.25	3.0	
30	2.45	2.65	5.1	2.95	
31	1.75		4.25		

[a] Frozen Dec. 6 to 31.

Daily gage height, in feet, of Piscataquis River near Foxcroft, 1902–1909—**Continued.**

Day.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.										
1	[a]3.9	5.05	3.25	2.35	2.4	3.65	2.1	1.5	1.75	1.75
2	4.05	4.85	3.1	2.3	2.4	2.7	2.05	1.5	1.75	1.75
3	4.25	4.75	2.95	2.25	2.4	2.55	2.05	1.5	1.75	1.65
4	4.25	5.0	2.9	2.2	2.4	2.55	1.85	1.5	1.75	1.65
5	4.5	5.35	2.9	2.2	2.25	2.45	2.35	1.75	1.75	1.75
6	4.05	5.05	2.85	2.05	2.35	2.45	2.0	1.8	1.75	1.6
7	3.9	4.3	2.9	2.0	2.25	2.25	1.9	1.75	1.75	1.75
8	3.75	4.6	2.85	2.0	2.25	2.25	1.7	1.75	1.7	1.75
9	4.5	5.8	2.7	2.5	2.35	2.1	2.0	1.75	1.95	1.75
10	5.4	5.7	2.8	2.15	2.45	2.35	1.9	1.75	2.0	1.75
11	8.45	5.6	2.7	2.15	2.55	2.55	1.7	1.75	1.9	1.7
12	10.9	4.85	2.6	2.25	2.55	2.85	1.7	1.75	2.1	1.7
13	9.6	4.55	2.55	4.7	2.45	2.85	1.5	1.75	2.3	1.85
14	8.95	4.45	2.55	6.95	2.4	2.9	1.6	1.7	2.4	2.05
15	7.8	4.2	2.55	4.8	2.45	2.6	1.7	1.6	2.2	2.15
16	7.05	4.4	2.55	4.25	2.45	2.5	2.0	1.5	2.4	2.35
17	5.8	4.8	2.55	4.25	2.5	2.3	1.9	1.5	2.1	2.05
18	6.1	4.55	2.55	4.05	2.6	2.3	1.7	1.55	2.2	2.0
19	5.5	4.45	2.55	4.0	2.3	2.25	1.9	2.5	2.0	2.0
20	6.55	4.4	2.6	3.7	2.4	2.3	1.6	2.4	1.8	2.15
21	6.75	4.45	2.75	3.8	2.35	2.85	1.8	2.3	1.95	3.75
22	6.55	4.1	3.15	2.95	2.35	3.0	1.8	2.3	1.65	4.4
23	6.8	4.05	3.15	2.75	2.6	2.75	1.75	2.05	1.8	4.1
24	7.25	3.8	2.95	2.75	3.05	2.6	1.7	2.1	2.1	3.85
25	7.05	3.75	2.35	2.7	2.9	2.4	1.6	1.5	2.0	3.35
26	6.15	3.4	2.45	2.7	3.15	2.25	1.5	1.7	1.9	3.3
27	5.8	3.3	2.35	2.55	3.15	2.25	1.5	1.75	1.85	2.9
28	5.3	3.4	2.3	2.5	2.5	2.25	1.5	1.75	1.85	3.2
29	5.0	3.3	2.3	2.4	2.45	2.3	1.5	1.8	1.85	3.2
30	4.65	3.3	2.0	2.4	2.65	1.9	1.5	1.8	1.75	3.1
31	4.4	....	2.3	....	3.8	2.2	....	1.8	....	3.05

[a] Frozen Jan. 1 to Feb. 28.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
1	3.0	3.8	3.0	4.7	7.0	2.4	3.2	2.3	2.0	4.0	3.2	2.4
2	3.0	3.4	3.0	4.6	5.6	2.3	3.4	2.4	2.0	4.0	3.2	2.8
3	3.0	3.0	3.0	4.5	5.2	2.3	3.7	2.2	2.0	3.6	3.0	2.8
4	3.1	2.9	3.1	4.3	5.5	2.3	3.7	2.1	2.5	3.5	3.0	2.6
5	3.0	2.8	3.3	4.2	4.9	2.7	3.6	2.1	2.6	3.2	3.0	2.8
6	3.2	2.8	3.6	5.0	4.8	3.4	3.2	2.1	2.6	3.2	2.8	2.7
7	3.2	2.2	3.6	5.0	4.6	4.2	3.2	2.1	2.6	3.0	3.0	2.6
8	3.0	2.8	3.8	5.5	3.8	3.6	3.0	2.1	2.6	3.0	3.0	2.6
9	2.9	2.8	4.4	5.8	4.0	3.3	3.0	2.2	2.6	2.4	3.0	2.6
10	2.5	2.8	4.9	7.0	6.4	3.2	2.9	2.2	2.2	2.2	3.0	2.6
11	3.2	2.8	5.2	10.2	6.9	2.6	2.9	2.4	3.6	2.6	3.0	2.7
12	3.2	2.6	5.0	8.6	8.2	2.0	2.9	2.4	3.3	2.6	3.0	2.6
13	3.2	2.5	4.6	6.2	6.2	2.0	3.0	2.4	2.2	2.6	2.6	2.7
14	3.4	2.6	4.6	4.6	5.4	2.3	3.2	2.4	2.3	2.6	3.0	2.5
15	3.4	2.8	4.5	4.2	4.4	2.3	3.2	2.7	.8	2.7	3.1	2.4
16	3.5	2.8	4.4	4.0	5.8	2.5	3.0	2.6	3.5	2.6	3.6	2.4
17	3.5	2.8	4.2	3.8	6.6	2.7	2.8	2.6	3.0	2.6	3.2	2.4
18	3.7	2.8	4.2	3.6	5.6	2.7	2.8	2.6	2.8	2.6	3.0	2.1
19	3.9	2.7	3.9	3.8	4.8	2.7	2.7	2.6	3.0	2.6	2.8	2.8
20	3.4	2.4	3.8	4.0	5.0	2.7	2.7	2.6	3.0	2.6	2.6	3.0
21	3.2	2.0	3.8	4.1	4.4	2.7	2.7	2.9	2.8	3.0	2.8	2.8
22	3.2	2.4	3.8	4.0	4.2	2.6	2.6	3.0	2.8	4.5	2.9	2.8
23	3.3	2.8	3.6	4.0	4.3	2.6	2.5	2.9	2.8	3.9	3.0	2.8
24	3.2	3.0	4.3	4.8	4.0	2.6	2.4	2.7	2.7	3.5	2.8	2.8
25	3.7	3.2	4.4	5.2	3.7	2.6	2.3	2.6	2.6	3.2	2.9	2.6
26	3.2	3.0	4.6	5.4	3.0	2.5	2.3	2.6	2.6	3.4	2.8	2.8
27	3.4	3.0	5.1	5.4	3.6	3.1	2.3	2.3	2.7	4.0	2.5	2.8
28	3.2	3.0	5.2	5.4	3.5	3.0	2.4	2.2	2.7	3.8	2.6	3.2
29	2.9	2.9	5.0	6.0	3.3	2.7	2.3	2.4	2.8	3.5	2.6	3.0
30	3.0	....	4.8	6.7	3.4	2.6	2.3	2.2	4.0	3.4	2.4	2.8
31	3.0	....	4.6	....	3.4	....	2.3	2.1	....	3.2	....	2.8

Daily gage height, in feet, of Piscataquis River near Foxcroft, 1902–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1	2.0	3.1	3.8	8.3	3.5	2.9	2.4	2.4	2.1	2.0	2.0	2.1
2	3.5	3.1	3.8	6.5	3.8	2.8	2.8	2.4	2.3	2.2	2.2	0.2
3	3.5	3.2	3.8	6.5	4.0	2.8	3.7	2.4	1.8	2.3	2.0	2.2
4	3.2	3.7	3.8	4.8	4.5	2.8	3.3	2.4	2.2	2.3	2.0	2.4
5	3.2	2.8	3.6	4.3	4.4	2.6	3.0	2.4	2.3	2.8	1.7	2.4
6	3.1	3.2	3.5	5.2	4.4	3.0	2.8	.8	2.6	2.2	2.0	2.4
7	3.0	3.7	3.0	8.2	4.2	3.0	2.8	2.0	2.6	2.0	2.0	2.4
8	3.0	3.7	2.6	5.7	4.0	2.8	2.8	2.1	2.7	1.8	2.0	2.4
9	3.4	3.2	2.6	4.7	3.9	2.8	2.6	2.1	2.2	2.3	2.3	2.2
10	4.0	3.2	2.5	4.7	3.9	2.7	2.6	2.2	2.0	2.3	2.2	2.0
11	4.0	3.2	2.4	4.7	3.1	2.4	2.6	2.2	2.3	2.3	2.0	2.2
12	4.0	3.2	2.4	4.9	3.1	2.6	2.6	2.2	2.4	2.3	1.7	2.5
13	4.0	3.2	2.5	5.0	3.3	3.1	2.5	1.5	2.4	2.3	2.0	2.6
14	4.0	3.2	2.5	4.8	3.7	3.1	2.5	2.3	2.4	2.3	2.2	2.6
15	3.6	3.3	2.6	5.2	4.1	3.0	2.0	2.3	2.4	1.7	2.0	2.6
16	4.0	3.4	2.6	5.0	3.3	3.0	2.0	2.3	2.3	2.2	1.9	2.6
17	3.6	3.3	2.6	4.6	3.3	2.8	2.2	2.2	2.0	2.2	2.2	2.2
18	3.7	3.2	2.6	4.3	3.3	2.9	2.0	2.2	2.0	2.2	2.4	2.1
19	3.8	2.8	2.4	4.4	3.3	3.3	2.0	2.2	1.7	2.0	2.6	2.2
20	3.7	3.0	2.8	3.6	3.8	3.5	2.1	2.2	1.7	1.9	2.2	2.0
21	3.4	3.0	3.0	3.9	3.8	3.4	2.1	2.2	1.8	1.9	2.2	2.0
22	3.4	3.1	3.0	4.6	3.4	3.2	2.0	2.2	2.2	1.6	2.2	2.0
23	3.6	3.2	3.1	4.7	3.2	3.1	2.0	2.2	2.2	1.9	2.1	2.0
24	3.6	3.3	3.2	4.3	3.2	2.9	2.2	2.2	1.9	1.9	2.0	2.0
25	3.6	3.4	3.2	4.2	3.2	3.0	2.2	2.2	2.0	1.9	1.9	2.0
26	3.4	4.2	3.2	4.3	3.1	2.8	2.2	2.2	2.0	1.9	1.8	2.0
27	3.6	4.2	4.8	4.4	3.3	2.9	2.2	1.8	2.2	1.9	2.3	2.0
28	3.4	4.0	5.4	4.4	3.3	2.9	2.2	2.0	2.2	1.9	2.2	2.0
29	2.8	......	6.5	3.8	2.9	2.8	2.2	2.0	1.9	1.5	2.2	1.9
30	3.2	......	[a] 6.6	3.5	2.9	2.5	2.2	2.1	1.9	1.5	2.0	1.9
31	3.2	......	8.0	......	2.9	......	2.5	2.1	......	1.5	......	1.9
1906.[b]												
1	2.2	3.8	3.5	3.8	5.8	3.3	2.0	2.6	2.6	2.3	3.5	3.2
2	2.2	3.6	3.2	3.8	6.2	3.0	2.4	2.6	2.6	2.8	3.6	3.8
3	2.2	3.4	3.2	3.8	6.1	3.4	2.4	2.5	2.7	2.8	3.6	3.8
4	2.2	2.9	2.8	3.8	6.1	3.4	2.4	2.4	2.7	1.9	3.6	3.8
5	2.8	3.4	3.5	3.8	6.2	3.4	2.3	2.3	2.7	1.9	3.6	3.7
6	2.2	3.4	3.6	4.0	6.2	3.5	2.2	2.3	2.7	1.8	3.4	3.7
7	2.2	3.2	3.4	4.0	5.9	4.8	2.2	2.2	2.6	1.6	3.4	3.5
8	2.2	3.0	3.4	3.8	5.5	4.2	1.8	2.1	2.5	2.2	3.2	3.4
9	2.2	3.0	3.1	3.8	5.2	3.8	2.1	2.0	2.4	2.2	3.2	3.4
10	2.2	3.0	3.1	3.6	8.1	3.5	2.1	2.2	2.5	3.8	3.0	3.2
11	2.2	2.8	2.8	3.4	6.5	3.0	2.2	2.2	2.5	4.2	3.0	3.2
12	2.2	3.1	2.8	3.3	5.1	3.0	3.4	2.2	2.5	3.5	3.1	3.2
13	2.2	3.1	3.0	3.2	4.6	3.0	2.8	2.3	2.4	3.3	3.1	3.2
14	2.2	3.1	3.0	3.2	5.1	2.8	2.8	2.3	2.6	2.8	3.1	3.4
15	2.2	3.0	3.0	3.8	4.8	2.8	2.5	2.2	2.5	2.8	3.1	3.8
16	2.4	3.2	3.0	8.0	4.7	2.6	2.6	2.2	2.0	2.7	3.0	3.6
17	2.5	3.4	2.8	10.0	4.6	2.6	2.6	2.2	2.0	2.4	3.3	3.2
18	3.0	2.5	3.0	7.6	4.5	2.6	2.6	2.2	2.4	2.4	3.4	3.4
19	8.2	3.4	3.2	6.4	3.5	2.6	2.6	2.7	2.4	2.4	3.4	3.4
20	3.3	3.4	3.4	6.3	3.5	2.3	2.5	2.4	3.2	2.0	3.4	3.4
21	3.3	3.4	3.4	6.3	3.6	2.0	2.4	2.4	3.0	2.8	3.4	3.5
22	3.4	3.4	3.4	6.5	3.6	2.3	3.2	2.4	2.6	2.9	3.3	3.6
23	3.6	3.4	3.4	6.5	3.6	2.3	2.9	2.5	2.4	3.0	3.2	3.7
24	3.8	3.6	3.2	6.0	3.0	2.6	2.9	2.7	2.2	3.0	3.1	3.7
25	4.4	3.4	3.1	4.2	3.0	2.9	2.9	2.6	2.8	3.3	3.1	3.6
26	4.6	3.1	3.2	4.6	3.2	2.6	2.6	2.5	2.7	4.2	3.3	3.6
27	4.6	3.0	3.4	4.8	3.2	2.6	2.6	3.0	2.8	3.8	3.3	3.4
28	4.2	3.4	3.5	5.6	3.8	2.2	2.6	3.2	2.4	3.7	3.3	3.4
29	4.2	......	3.8	5.6	3.8	2.2	2.4	2.9	2.2	3.8	3.2	3.4
30	3.8	......	3.8	5.4	3.8	2.1	2.6	2.8	1.7	3.4	3.2	3.4
31	3.8	......	4.0	......	3.5	......	2.6	2.7	......	3.4	......	3.4

[a] Ice in river broke up Mar. 30; river clear of ice Apr. 7. River did not freeze at section near gage during 1905.

[b] River frozen over through February and probably through January. Gage heights are to water surface in hole cut in ice. River open on Apr. 7. The following thicknesses of ice were obtained: Feb. 17, 1.4; Feb. 24, 1.1; Mar. 3, 1.2; Mar. 10, 1.0; Mar. 17, 1.5; Mar. 24, 1.7; Mar. 31, 1.5.

Daily gage height, in feet, of Piscataquis River near Foxcroft, 1902–1909—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.[a]												
1	3.6	3.6	3.4	4.5	9.4	3.6	5.6	3.2	2.3	4.0	4.2	3.0
2	4.1	3.6	3.3	4.5	8.6	3.2	5.6	3.2	2.3	3.7	4.0	3.1
3	4.0	3.3	3.1	4.3	7.0	3.2	5.5	3.0	2.7	3.5	4.8	3.1
4	3.7	3.6	3.2	6.3	5.5	3.0	5.0	3.0	3.0	4.0	5.4	3.1
5	3.5	3.6	3.3	4.2	5.5	3.0	4.4	3.2	4.3	4.0	5.0	3.1
6	3.4	3.6	3.3	4.4	5.9	3.0	3.4	3.6	4.5	3.6	4.5	3.1
7	3.2	3.6	3.3	4.0	4.9	2.8	3.4	4.2	3.9	3.5	9.3	3.1
8	3.2	3.4	3.3	3.9	5.7	3.1	3.5	4.2	3.4	3.8	9.0	2.7
9	3.2	3.4	3.4	3.9	5.8	3.2	3.4	3.9	3.4	5.2	6.9	2.9
10	3.4	3.0	3.3	3.9	5.7	3.2	3.1	3.5	3.3	4.4	5.4	5.5
11	3.5	3.5	3.3	3.8	5.7	3.2	3.2	3.2	3.4	4.4	4.7	9.1
12	3.6	3.1	3.3	3.6	4.6	3.2	3.2	3.1	3.4	4.0	4.4	5.6
13	3.4	3.3	3.2	3.5	4.6	3.2	3.3	3.0	3.2	3.9	4.1	4.4
14	3.5	3.2	3.2	3.4	4.5	3.0	3.3	2.9	3.2	3.8	3.8	4.2
15	3.6	3.2	3.2	3.9	4.5	2.6	3.1	2.5	3.2	3.6	3.6	3.8
16	3.6	3.2	3.5	4.2	4.5	2.6	2.9	2.4	3.2	3.8	3.4	3.7
17	3.6	2.9	3.5	4.3	4.9	2.6	2.8	2.6	3.2	4.0	3.2	3.6
18	3.6	3.8	4.4	4.6	5.0	2.6	2.8	3.2	3.2	3.8	3.4	3.4
19	3.6	3.7	4.4	4.8	5.2	2.6	2.8	3.1	3.2	3.4	3.4	3.4
20	3.6	3.7	4.1	3.9	5.0	2.6	2.8	3.0	3.2	3.4	3.4	3.4
21	3.6	3.7	3.6	3.7	4.4	2.6	2.8	2.5	3.0	3.4	3.2	3.4
22	3.6	3.7	3.6	4.2	3.5	2.5	2.5	2.4	2.9	3.4	3.1	3.4
23	3.6	3.4	3.5	4.7	3.4	2.7	3.0	2.4	2.9	3.4	3.1	3.6
24	3.6	3.4	3.6	7.3	3.4	2.6	3.1	2.3	2.9	3.3	3.0	3.6
25	3.9	3.2	3.9	8.4	3.4	2.8	3.1	2.3	3.1	3.3	3.2	3.6
26	3.6	3.6	3.9	7.2	3.2	3.1	3.8	2.4	3.1	3.2	3.4	3.6
27	3.5	3.4	3.9	7.2	3.4	4.2	4.0	2.6	3.0	2.9	3.4	3.6
28	3.4	3.4	3.9	7.2	3.5	6.0	3.5	2.7	3.0	3.0	3.3	3.6
29	3.4	....	3.9	7.0	4.4	4.4	3.3	2.5	2.8	5.4	3.1	3.6
30	3.4	....	3.9	7.6	4.0	3.9	3.2	2.3	3.6	6.2	3.1	3.1
31	3.3	....	4.4	....	3.6	....	3.2	2.3	....	4.8	....	3.1
1908.[b]												
1	3.8	3.6	3.55	3.65	8.6	5.1	2.1	2.05	2.25	2.2	1.9	2.2
2	3.8	3.6	3.55	3.75	8.1	4.5	1.95	2.1	2.25	2.5	1.95	2.45
3	3.8	4.0	3.55	4.05	6.75	4.15	1.95	2.3	2.15	2.2	1.95	2.6
4	3.8	4.1	3.55	4.35	6.7	3.8	1.95	2.2	2.1	1.9	2.05	2.5
5	3.65	4.25	3.55	3.8	5.7	3.4	1.8	2.45	2.1	2.2	1.95	2.4
6	3.65	4.25	3.55	3.25	5.55	3.4	1.8	2.95	2.1	2.2	1.8	2.25
7	4.05	4.25	3.35	3.5	5.35	3.2	1.75	2.95	2.1	2.2	1.8	2.25
8	4.1	4.25	3.35	3.65	4.55	3.2	1.7	2.95	2.25	2.2	1.6	2.25
9	4.5	3.85	3.35	3.75	5.25	3.05	1.7	2.95	2.3	2.2	1.8	2.5
10	4.0	3.85	3.35	3.9	5.55	2.8	1.7	2.9	2.3	2.2	1.8	2.5
11	3.5	3.7	3.35	3.75	5.25	2.4	1.7	2.85	2.4	1.9	1.8	2.5
12	3.5	3.7	3.35	4.1	4.4	2.4	1.65	2.7	2.4	2.35	1.8	2.5
13	3.4	3.6	3.35	3.95	4.5	2.3	2.2	2.7	2.4	2.1	1.8	1.8
14	3.4	3.6	3.3	3.75	4.5	2.3	2.2	2.45	2.4	1.95	1.8	2.4
15	3.3	4.0	3.4	3.7	4.5	2.3	2.2	2.45	2.3	1.95	1.6	2.4
16	3.2	4.6	3.4	4.1	4.4	2.3	2.2	2.45	2.15	1.95	1.6	2.4
17	3.2	4.9	4.4	4.2	4.3	2.3	2.2	2.5	2.15	1.95	1.6	2.4
18	3.2	4.7	4.35	3.8	4.1	2.3	2.2	2.5	2.0	1.7	1.6	2.5
19	3.25	4.25	3.85	3.55	3.95	2.3	2.2	2.5	2.0	1.95	1.5	2.5
20	3.3	4.25	3.6	4.0	3.9	2.3	2.2	2.4	2.0	1.95	1.4	1.7
21	3.2	4.25	3.4	4.0	3.8	2.2	2.2	2.3	2.2	1.95	1.2	2.45
22	3.2	4.0	3.4	3.95	3.6	2.3	2.15	2.0	2.2	1.95	1.0	2.4
23	3.2	3.6	3.35	4.3	3.5	2.25	2.2	2.0	2.2	1.95	1.45	2.4
24	3.2	3.6	3.5	4.95	3.35	2.25	2.25	2.0	2.2	1.95	1.6	2.45
25	3.2	3.55	3.9	5.35	3.3	2.25	2.1	2.0	2.2	1.6	1.85	2.4
26	3.0	3.55	4.25	6.35	3.3	2.1	1.9	1.95	2.2	1.95	2.2	2.4
27	3.55	3.4	4.1	7.9	3.55	2.1	1.9	1.95	1.4	2.45	2.6	2.45
28	3.55	3.4	3.85	8.1	3.7	2.1	1.9	1.9	1.8	2.75	3.0	2.45
29	3.65	3.4	3.7	8.6	3.55	2.25	1.9	1.9	1.95	2.5	2.55	2.45
30	3.6	....	3.6	7.2	5.35	2.25	1.9	1.9	1.95	2.35	2.55	2.45
31	3.6	....	3.6	....	5.1	....	1.9	1.9	....	2.25	....	2.35

[a] River frozen over more or less completely from about Jan. 10 to Apr. 7, 1907. During the frozen season gage heights were taken to water surface in a hole in the ice.

[b] Ice conditions prevailed from about Feb. 1 to 15, 1908, and it is probable that the discharge may have been more or less affected by ice conditions for short periods during the remainder of the winter months.

Daily gage height, in feet, of Piscataquis River near Foxcroft, 1902–1909—**Continued.**

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.[a]												
1	2.2	3.5	5.0	4.2	4.45	3.15	2.15	1.55	2.25	4.65	2.65	3.55
2	2.2	3.25	4.95	4.05	4.3	3.0	2.15	1.55	2.25	4.25	2.65	3.45
3	2.2	3.2	4.7	4.0	4.75	2.85	2.15	1.55	2.25	3.95	2.65	3.35
4	2.25	3.2	4.7	3.75	5.55	2.85	2.7	1.55	2.25	3.75	3.5	3.2
5	2.25	3.2	4.7	3.8	5.6	2.85	2.7	1.55	2.5	3.75	3.5	3.2
6	3.4	3.35	4.7	4.25	5.45	2.5	2.55	1.55	2.45	3.6	3.1	3.2
7	5.25	3.25	4.5	5.1	5.45	2.7	2.4	1.55	2.3	2.7	2.9	3.3
8	4.25	3.25	4.5	5.9	5.45	2.7	2.3	1.55	2.3	2.7	3.0	3.3
9	4.25	3.25	4.4	6.05	5.3	2.65	2.2	1.55	2.25	2.5	2.95	3.3
10	3.9	3.25	4.4	4.7	5.45	2.55	2.2	1.55	2.25	2.45	2.95	3.8
11	3.75	2.95	4.4	4.4	5.45	2.5	1.8	1.55	2.25	2.45	2.95	4.0
12	3.25	2.95	4.25	4.4	6.25	2.5	2.2	1.55	1.8	2.45	2.65	3.35
13	3.25	3.1	4.25	4.55	6.4	2.2	2.2	1.55	2.1	2.9	2.65	3.0
14	3.25	2.95	4.25	6.65	6.0	2.1	1.95	1.55	2.0	3.7	2.5	2.9
15	3.25	2.95	4.25	9.65	5.7	2.1	1.95	1.2	1.95	3.7	2.65	3.05
16	3.25	2.95	4.0	9.2	5.6	2.05	1.95	1.7	1.95	3.7	2.65	3.05
17	3.15	3.2	4.0	7.5	5.1	2.05	1.95	2.05	1.95	2.95	2.7	2.9
18	3.75	3.3	4.1	6.45	4.8	2.95	1.9	2.25	2.0	2.95	2.7	2.9
19	3.75	3.3	4.1	6.35	4.8	3.35	1.95	2.15	1.8	3.05	2.7	2.9
20	3.2	3.5	4.1	7.15	4.35	3.7	2.3	2.2	1.95	3.1	2.7	2.85
21	3.0	3.5	3.8	7.0	3.85	2.8	2.3	2.2	2.0	3.1	2.6	2.8
22	3.0	5.3	4.05	6.5	3.25	2.8	2.3	1.8	2.0	3.2	2.8	2.8
23	2.95	5.5	4.05	6.4	3.0	2.5	2.3	2.1	2.0	3.2	2.65	2.8
24	2.0	5.65	4.05	6.0	2.95	2.3	2.3	2.1	2.0	2.9	2.65	2.8
25	2.95	5.8	4.05	5.6	2.95	2.3	2.0	2.15	2.0	3.05	2.65	2.55
26	2.95	5.75	4.15	5.6	2.95	2.3	1.95	2.15	1.7	3.1	4.1	2.5
27	3.2	5.7	4.75	5.6	2.95	2.0	1.95	2.15	2.3	3.1	3.9	2.65
28	3.25	5.6	4.8	5.6	2.95	2.2	1.95	2.15	4.7	3.15	3.7	2.65
29	3.25	....	4.8	5.45	2.95	2.15	1.95	1.8	12.75	3.05	3.7	2.65
30	3.25	....	4.85	4.95	2.7	2.15	1.95	2.15	6.1	2.85	3.55	3.0
31	2.75	....	4.6	....	2.7	....	1.95	2.15	....	2.65	....	3.0

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[a] No ice conditions were reported for 1909, yet it is believed that ice was present during the winter months.

Rating table for Piscataquis River near Foxcroft, 1902–1909.[a]

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1.00	5	2.30	123	3.60	858	5.80	3,610
1.10	7	2.40	148	3.70	938	6.00	3,970
1.20	9	2.50	180	3.80	1,023	6.20	4,335
1.30	12	2.60	220	3.90	1,113	6.40	4,705
1.40	15	2.70	267	4.00	1,208	6.60	5,080
1.50	19	2.80	318	4.20	1,403	6.80	5.460
1.60	24	2.90	374	4.40	1,615	7.00	5,840
1.70	31	3.00	437	4.60	1,840	8.00	7,810
1.80	40	3.10	502	4.80	2,085	9.00	9,860
1.90	51	3.20	569	5.00	2,350	10.00	11,960
2.00	64	3.30	638	5.20	2,635	11.00	14,160
2.10	81	3.40	709	5.40	2,940	12.00	16,360
2.20	100	3.50	782	5.60	3,265	13.00	18,660

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[a] The above table supersedes all ratings previously published for this station. It is not applicable for ice or obstructed-channel conditions. It is based on discharge measurements made during 1902 to 1909 and is well defined between gage heights 1.5 feet and 7 feet.

Daily discharge, in second-feet, of Piscataquis River near Foxcroft, 1902–1909.

Day.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	Aug.	Sept.	Oct.	Nov.	Dec.
1902.						1902.					
1	....	148	220	1,110	437	16	....	569	100	638	....
2	....	148	220	858	437	17	148	569	220	782	....
3	....	148	220	782	374	18	318	318	100	709	....
4	....	148	148	782	318	19	220	318	64	437	....
5	....	180	148	638	267	20	180	318	374	569	....
6	....	148	123	709	....	21	318	267	709	569	....
7	....	148	374	502	....	22	220	220	502	569	....
8	....	220	569	569	....	23	148	220	437	437	....
9	....	220	502	437	....	24	148	267	437	437	....
10	....	638	437	502	....	25	220	220	374	437	....
11	....	858	318	374	....	26	267	220	267	318	....
12	....	569	180	569	....	27	318	220	318	437	....
13	....	148	267	1,020	....	28	267	100	1,210	437	....
14	....	267	148	782	....	29	180	148	4,340	437	....
15	....	437	81	709	....	30	148	220	2,490	....	....
						31	90	....	1,400	....	....

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1903.												
1	....	....	1,110	2,350	569	148	148	858	81	19	40	40
2	....	....	1,210	2,080	502	123	148	267	64	19	40	40
3	....	....	1,400	2,080	437	100	148	220	64	19	40	24
4	....	....	1,400	2,350	374	100	148	220	40	19	40	24
5	....	....	1,720	2,940	374	100	100	148	148	40	40	40
6	....	....	1,210	2,350	318	64	148	148	64	40	40	24
7	....	....	1,110	1,510	374	64	100	100	51	40	40	40
8	....	....	1,020	1,840	318	64	100	100	31	40	31	40
9	....	....	1,720	3,610	267	180	148	81	64	40	64	40
10	....	....	2,940	3,440	318	100	148	148	51	40	64	40
11	....	....	8,610	3,260	267	100	220	220	31	40	51	31
12	....	....	13,800	2,080	220	100	220	318	31	40	81	31
13	....	....	11,100	1,840	220	1,960	148	318	19	40	123	40
14	....	....	9,860	1,620	220	5,840	148	374	24	31	148	64
15	....	....	7,410	1,400	220	2,080	148	220	31	24	100	100
16	....	....	5,840	1,620	220	1,400	148	180	64	19	148	148
17	....	....	3,610	2,080	220	1,400	180	123	51	19	81	64
18	....	....	4,150	1,840	220	1,210	220	123	31	24	100	64
19	....	....	3,100	1,620	220	1,210	123	100	51	180	64	64
20	....	....	5,080	1,620	220	938	148	123	24	148	40	100
21	....	....	5,460	1,620	318	1,020	148	318	40	123	64	1,020
22	....	....	5,080	1,300	569	437	148	437	40	123	24	1,620
23	....	....	5,460	1,210	569	318	220	318	40	64	40	1,300
24	....	....	6,230	1,020	437	318	437	220	31	81	81	1,020
25	....	....	5,840	1,020	148	267	374	148	24	19	64	709
26	....	....	4,340	709	148	267	569	100	19	31	51	638
27	....	....	3,610	638	148	220	569	100	19	40	40	374
28	....	....	2,790	709	123	180	180	100	19	40	40	569
29	....	....	2,350	638	123	148	148	123	19	40	40	569
30	....	....	1,840	638	64	148	220	51	19	40	40	502
31	....	....	1,620	....	123	....	1,020	100	....	40	....	437
1904.												
1	437	1,020	437	1,960	5,840	148	569	123	64	1,210	569	148
2	437	709	437	1,840	3,260	123	709	148	64	1,210	569	318
3	437	437	437	1,720	2,640	123	938	100	64	858	437	318
4	502	374	502	1,510	3,100	123	938	81	180	782	437	220
5	437	318	638	1,400	2,220	267	858	81	220	569	437	318
6	569	318	858	2,350	2,080	709	569	81	220	569	318	267
7	569	100	858	2,350	1,840	1,400	569	81	220	437	437	220
8	437	318	1,020	3,100	1,020	858	437	81	220	437	437	220
9	374	318	1,620	3,610	1,210	638	437	100	220	148	437	220
10	180	318	2,220	5,840	4,700	569	374	100	100	100	437	220
11	569	318	2,640	12,400	5,650	220	374	148	858	220	437	267
12	569	220	2,350	9,020	8,210	64	374	148	638	220	437	220
13	569	180	1,840	4,340	4,340	64	437	148	100	220	220	267
14	709	220	1,840	1,840	2,940	123	569	148	123	220	437	180
15	709	318	1,720	1,400	1,620	123	569	267	318	267	502	148

Daily discharge, in second-feet, of Piscataquis River near Foxcroft, 1902–1909—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.												
16	782	318	1,620	1,210	3,610	180	437	220	782	220	858	148
17	782	318	1,400	1,020	5,080	267	318	220	437	220	569	148
18	938	318	1,400	858	3,260	267	318	220	318	220	437	81
19	1,110	267	1,110	1,020	2,080	267	267	220	437	220	318	318
20	709	148	1,020	1,210	2,350	267	267	220	437	220	220	437
21	569	64	1,020	1,300	1,620	267	267	374	318	437	318	318
22	569	148	1,020	1,210	1,400	220	220	437	318	1,720	374	318
23	638	318	858	1,210	1,510	220	180	374	318	1,110	437	318
24	569	437	1,510	2,080	1,210	220	148	267	267	782	318	318
25	938	569	1,620	2,640	938	220	123	220	220	569	374	220
26	569	437	1,840	2,940	437	180	123	220	220	709	318	318
27	709	437	2,490	2,940	858	502	123	123	267	1,210	180	318
28	569	437	2,640	2,940	782	437	148	100	267	1,020	220	569
29	374	374	2,350	3,970	638	267	123	148	318	782	220	437
30	437	......	2,080	5,270	709	220	123	100	1,210	709	148	318
31	437	......	1,840	......	709	......	123	......	......	569	......	318
1905.												
1	64	502	1,020	8,410	782	374	148	148	81	64	64	81
2	782	502	1,020	4,890	1,020	318	318	148	123	100	64	100
3	782	569	1,020	4,890	1,210	318	938	148	40	123	64	100
4	569	938	1,020	2,080	1,720	318	638	148	100	123	64	148
5	569	318	858	1,510	1,620	220	437	148	123	123	31	148
6	502	569	782	2,640	1,620	437	318	5	220	100	64	148
7	437	938	437	8,210	1,400	437	318	64	220	64	64	148
8	437	938	220	3,440	1,210	318	318	81	267	40	64	148
9	709	569	220	1,960	1,110	318	220	81	100	123	123	100
10	1,210	569	180	1,960	1,110	267	220	100	64	123	100	64
11	1,210	569	148	1,960	502	148	220	100	123	123	64	100
12	1,210	569	148	2,220	502	220	220	100	148	123	31	180
13	1,210	569	180	2,350	638	502	180	19	148	123	64	220
14	1,210	569	180	2,080	938	502	180	123	148	123	100	220
15	858	638	220	2,640	1,300	437	64	123	148	31	64	220
16	1,210	709	220	2,350	638	437	64	123	123	100	51	220
17	858	638	220	1,840	638	318	100	100	64	100	100	100
18	938	569	220	1,510	638	374	64	100	64	100	148	81
19	1,020	318	148	1,620	638	638	64	100	31	64	220	100
20	938	437	318	858	1,020	782	81	100	31	51	100	64
21	709	437	437	1,110	1,020	709	81	100	40	51	100	64
22	709	502	437	1,840	709	569	64	100	100	24	100	64
23	858	569	502	1,960	569	502	64	100	100	51	81	64
24	858	638	569	1,510	569	374	100	100	51	51	64	64
25	858	709	569	1,400	569	437	100	100	64	51	51	64
26	709	1,400	569	1,510	502	318	100	100	64	51	40	64
27	858	1,400	2,080	1,620	638	374	100	40	100	51	123	64
28	709	1,210	2,940	1,620	638	374	100	64	100	51	100	64
29	318	......	4,890	1,020	374	318	100	64	51	19	100	51
30	569	......	5,080	782	374	180	100	81	51	19	64	51
31	569	......	7,810	......	374	......	180	81	......	19	......	51
1906.												
1	......	......	......	......	3,610	638	64	220	220	123	782	569
2	......	......	......	......	4,340	437	148	220	220	318	858	1,020
3	......	......	......	......	4,150	709	148	180	267	318	858	1,020
4	......	......	......	......	4,150	709	148	148	267	51	858	1,020
5	......	......	......	......	4,340	709	123	123	267	51	858	938
6	......	......	......	......	4,340	782	100	123	267	40	709	938
7	......	......	......	1,210	3,790	2,080	100	100	220	24	709	782
8	......	......	......	1,020	3,100	1,400	40	81	180	100	569	709
9	......	......	......	1,020	2,640	1,020	81	64	148	100	569	709
10	......	......	......	858	8,010	782	81	100	180	1,020	437	569
11	......	......	......	709	4,890	437	100	100	180	1,400	437	569
12	......	......	......	638	2,490	437	709	100	180	782	502	569
13	......	......	......	569	1,840	437	318	123	148	638	502	569
14	......	......	......	569	2,490	318	318	123	220	318	502	709
15	......	......	......	1,020	2,080	318	180	100	180	318	502	1,020
16	......	......	......	7,810	1,960	220	220	100	64	267	437	858
17	......	......	......	12,000	1,840	220	220	100	64	148	638	569
18	......	......	......	7,010	1,720	220	220	100	148	148	709	709
19	......	......	......	4,700	782	220	220	267	148	148	709	709
20	......	......	......	4,520	782	123	180	148	569	64	709	709

Daily discharge, in second-feet, of Piscataquis River near Foxcroft, 1902–1909—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
21	......	......	......	4,520	858	64	148	148	437	318	709	827
22	......	......	......	4,890	858	123	569	148	220	374	638	588
23	......	......	......	4,890	858	123	374	180	148	437	569	983
24	......	......	......	3,970	437	220	374	267	100	437	502	938
25	......	......	......	1,400	437	374	374	220	318	638	502	858
26	......	......	......	1,840	569	220	220	180	267	1,400	638	858
27	......	......	......	2,080	569	220	220	437	318	1,020	638	709
28	......	......	......	3,260	1,020	100	220	569	148	938	638	709
29	......	......	......	3,260	1,020	100	148	374	100	1,020	569	709
30	......	......	......	2,940	1,020	81	220	318	31	709	569	709
31	......	......	......	......	782	......	220	267	......	709	......	709
1907.												
1	......	......	......	......	10,700	858	3,260	569	123	1,210	1,400	437
2	......	......	......	......	9,020	509	3,260	569	123	938	1,210	502
3	......	......	......	......	5,840	569	3,100	437	267	782	2,080	502
4	......	......	......	......	4,890	437	2,350	437	437	1,210	2,940	502
5	......	......	......	......	3,100	437	1,620	569	1,510	1,210	2,350	502
6	......	......	......	......	3,790	437	709	858	1,720	858	1,720	502
7	......	......	......	......	2,220	318	709	1,400	1,110	782	10,500	502
8	......	......	......	1,110	3,440	502	782	1,400	709	1,020	9,860	267
9	......	......	......	1,110	3,610	569	709	1,110	709	2,640	5,650	374
10	......	......	......	1,110	3,440	569	502	782	638	1,620	2,940	3,100
11	......	......	......	1,020	3,440	569	569	569	709	1,620	1,960	10,100
12	......	......	......	858	1,840	569	569	502	709	1,210	1,620	3,260
13	......	......	......	782	1,840	569	638	437	569	1,110	1,300	1,620
14	......	......	......	709	1,720	437	638	374	569	1,020	1,020	1,400
15	......	......	......	1,110	1,720	220	502	180	569	858	858	1,020
16	......	......	......	1,400	1,720	220	374	148	569	1,020	709	938
17	......	......	......	1,510	2,220	220	318	220	569	1,210	569	858
18	......	......	......	1,840	2,350	220	318	569	569	1,020	709	709
19	......	......	......	2,080	2,640	220	318	502	569	709	709	709
20	......	......	......	1,110	2,350	220	318	437	569	709	709	709
21	......	......	......	938	1,620	220	318	180	437	709	569	709
22	......	......	......	1,400	782	180	180	148	374	709	502	709
23	......	......	......	1,960	709	267	437	148	374	709	502	858
24	......	......	......	6,420	709	220	502	123	374	638	437	852
25	......	......	......	8,610	709	318	502	123	502	638	569	888
26	......	......	......	6,230	569	502	1,020	148	502	569	709	858
27	......	......	......	6,230	709	1,400	1,210	220	437	374	709	858
28	......	......	......	6,230	782	3,970	782	267	437	437	638	858
29	......	......	......	5,840	1,620	1,620	638	180	318	2,940	502	858
30	......	......	......	7,010	1,210	1,110	569	123	858	4,340	502	502
31	......	......	......	......	858	......	569	123	......	2,080	......	502
1908.												
1	1,020	......	820	898	9,040	2,490	81	72	111	100	51	100
2	1,020	......	820	980	8,020	1,720	58	81	111	180	58	163
3	1,020	......	820	1,260	5,360	1,350	58	123	90	100	58	220
4	1,020	......	820	1,560	5,270	1,020	58	100	81	51	72	180
5	898	......	820	1,020	3,440	709	40	163	81	100	58	148
6	898	......	820	604	3,180	709	40	405	81	100	40	111
7	1,260	......	674	782	2,860	569	36	405	81	100	40	111
8	1,300	......	674	898	1,780	569	31	405	111	100	24	111
9	1,720	......	674	980	2,710	470	31	405	123	100	40	180
10	1,210	......	674	1,110	3,180	318	31	374	123	100	40	180
11	782	......	674	980	2,710	148	31	345	148	51	40	180
12	782	......	674	1,300	1,620	148	28	267	148	135	40	180
13	709	......	674	1,160	1,720	123	100	267	148	81	40	40
14	709	......	638	980	1,720	123	100	163	148	58	40	148
15	638	......	709	938	1,720	123	100	163	123	58	24	148
16	569	1,840	709	1,300	1,620	123	100	163	90	58	24	148
17	569	2,220	1,620	1,400	1,510	123	100	180	90	58	24	148
18	569	1,960	1,560	1,020	1,300	123	100	180	64	31	24	180
19	600	1,460	1,070	820	1,160	123	100	180	64	58	19	180
20	638	1,460	858	1,210	1,110	123	100	148	64	58	15	31
21	569	1,460	709	1,210	1,020	100	100	123	100	58	9	163
22	569	1,210	709	1,160	858	123	90	64	100	58	5	148
23	569	858	674	1,510	782	111	100	64	100	58	17	148
24	569	838	782	2,280	674	111	111	64	100	58	24	163
25	569	820	1,110	2,860	638	111	81	64	100	24	46	148

Daily discharge, in second-feet, of Piscataquis River near Foxcroft, 1902–1909—Contd.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1908.												
26	437	820	1,460	4,610	638	81	51	58	100	58	100	148
27	820	709	1,300	7,610	820	81	51	58	15	163	220	163
28	820	709	1,070	8,020	938	81	51	51	40	292	437	163
29	898	709	938	9,040	820	111	51	51	58	180	199	163
30	858	......	858	6,230	2,860	111	51	51	58	135	199	163
31	858	......	858	......	2,490	......	51	51	......	111	......	135
1909.												
1	100	......	......	1,400	1,670	536	90	22	111	1,900	243	820
2	100	......	......	1,260	1,510	437	90	22	111	1,460	243	746
3	100	......	......	1,210	2,020	345	90	22	111	1,160	243	674
4	111	......	......	980	3,180	345	267	22	111	980	782	569
5	111	......	......	1,020	3,260	345	267	22	180	980	782	569
6	709	......	......	1,460	3,020	180	199	22	163	858	502	569
7	2,710	......	......	2,490	3,020	267	148	22	123	267	374	638
8	1,460	......	......	3,790	3,020	267	123	22	123	267	437	638
9	......	......	......	4,060	2,780	243	100	22	111	180	405	638
10	......	......	......	1,960	3,020	199	100	22	111	163	405	1,020
11	......	......	......	1,620	3,020	180	40	22	111	163	405	1,210
12	......	......	......	1,620	4,430	180	100	22	40	374	243	674
13	......	......	......	1,780	4,700	100	100	22	81	938	243	437
14	......	......	......	5,180	3,970	81	58	22	64	938	180	374
15	......	......	......	11,200	3,440	81	58	9	58	938	243	470
16	......	......	......	10,300	3,260	72	58	31	58	938	243	470
17	......	......	......	6,820	2,490	72	58	72	58	405	267	374
18	......	......	......	4,800	2,080	405	51	111	64	405	267	......
19	......	......	......	4,610	2,080	674	58	90	40	470	267	......
20	......	......	......	6,130	1,560	938	123	100	58	502	267	......
21	......	......	......	5,840	1,070	318	123	100	64	502	220	......
22	......	......	......	4,890	604	318	123	40	64	569	318	......
23	......	......	......	4,700	437	180	123	81	64	569	243	......
24	......	......	......	3,970	405	123	123	81	64	374	243	......
25	......	......	......	3,260	405	123	64	90	51	470	243	......
26	......	......	......	3,260	405	123	58	90	31	502	1,300	......
27	......	......	......	3,260	405	64	58	90	123	502	1,110	......
28	......	......	......	3,260	405	100	58	90	1,960	536	938	......
29	......	......	......	3,020	405	90	58	40	18,100	470	938	......
30	......	......	......	2,280	267	90	58	90	4,150	345	820	......
31	......	......	......	......	267	......	58	90	......	243	......	......

Monthly discharge of Piscataquis River near Foxcroft, 1902–1909.

[Drainage area, 286 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1902.						
Aug. 17–31	318	40	209	0.730	0.41	A.
September	858	100	287	1.00	1.12	A.
October	4,340	64	558	1.95	2.25	A.
November	1,110	318	600	2.10	2.34	A.
Dec. 1–5	437	267	367	1.28	.24	A.
1903.						
March	13,800	1,020	4,260	14.9	17.2	C.
April	3,610	638	1,770	6.19	6.91	B.
May	569	64	286	1.00	1.15	A.
June	5,840	64	687	2.40	2.68	A.
July	1,020	100	228	.797	.92	A.
August	858	51	207	.724	.83	A.
September	148	19	42.8	.150	.17	B.
October	180	19	49.1	.172	.20	B.
November	148	24	62	.217	.24	B.
December	1,620	24	317	1.11	1.28	B.

Monthly discharge of Piscataquis River near Foxcroft, 1902–1909—Continued.

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1904.						
January	1,110	180	587	2.05	2.36	B.
February	1,020	64	347	1.21	1.30	C.
March	2,640	437	1,460	5.10	5.88	C.
April	12,400	858	2,880	10.1	11.27	B.
May	8,210	437	2,510	8.78	10.12	A.
June	1,400	64	318	1.11	1.24	A.
July	938	123	388	1.36	1.57	A.
August	437	81	174	.608	.70	A.
September	1,210	64	325	1.13	1.26	A.
October	1,720	100	587	2.05	2.36	A.
November	858	148	396	1.38	1.54	A.
December	569	81	273	.955	1.10	B.
The year	12,400	64	854	2.99	40.70	
1905.						
January	1,210	64	788	2.76	3.18	B.
February	1,400	318	674	2.36	2.46	C.
March	7,810	148	1,120	3.92	4.52	C.
April	8,410	782	2,460	8.60	9.60	B.
May	1,720	374	858	3.00	3.46	A.
June	782	148	394	1.38	1.54	A.
July	938	64	200	.699	.81	A.
August	148	5	96.4	.337	.39	B.
September	267	31	103	.360	.40	B.
October	123	19	76.1	.266	.31	B.
November	220	31	82.2	.287	.32	B.
December	220	51	108	.378	.44	B.
The year	8,410	5	579	2.02	27.38	
1906.						
Apr. 7-30[a]	12,000	569	3,200	11.2	10.00	B.
May	8,010	437	2,320	8.11	9.35	A.
June	2,080	64	461	1.61	1.80	A.
July	709	40	220	.769	.87	A.
August	569	64	185	.647	.75	A.
September	569	31	207	.724	.81	A.
October	1,400	24	464	1.62	1.87	A.
November	858	437	627	2.19	2.44	A.
December	1,020	569	776	2.71	3.12	A.
1907.[b]						
January	1,300	....	499	1.75	2.02	D.
February	....	....	250	.874	.91	D.
March	....	....	300	1.05	1.21	D.
April	8,610	....	2,400	8.39	9.36	A.
May	10,700	569	2,650	9.27	10.69	A.
June	3,970	180	618	2.16	2.41	A.
July	3,260	180	913	3.19	3.68	A.
August	1,400	123	447	1.56	1.80	A.
September	1,720	123	598	2.09	2.33	A.
October	4,340	374	1,190	4.16	4.80	A.
November	10,500	437	1,880	6.57	7.33	A.
December	10,100	267	1,190	4.16	4.80	A.
The year	10,700	....	1,080	3.77	51.34	
1908.						
January	1,720	437	822	2.87	3.31	D.
February	2,220	....	796	2.78	3.00	D.
March	1,620	638	880	3.08	3.55	D.
April	9,040	604	2,190	7.66	8.55	A.
May	9,040	638	2,370	8.29	9.56	A.
June	2,490	81	408	1.43	1.60	A.
July	100	28	68.1	.238	.27	B.
August	405	51	171	.598	.69	A.
September	148	15	95	.332	.37	B.
October	292	24	92.6	.324	.37	B.
November	437	5	67.6	.236	.26	B.
December	220	31	148	.518	.60	C.
The year	9,040	5	676	2.36	32.13	

[a] An estimate of 550 second-feet per day for Apr. 1 to 6 gives a monthly mean of 2,670 second-feet for April.

[b] Estimates of discharge during the frozen periods 1907–8, based on climatological reports and the discharge of adjacent drainages.

Monthly discharge of Piscataquis River near Foxcroft, 1902–1909—Continued.

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1909.[a]						
January	2,710		296	1.03	1.19	D.
February			150	.524	.55	D.
March			500	1.75	2.02	D.
April	11,200	980	3,710	13.00	14.50	B.
May	4,700	267	2,020	7.06	8.14	A.
June	938	64	249	.871	.97	A.
July	267	40	99.4	.348	.40	B.
August	111	9	51.7	.181	.21	B.
September	18,100	31	885	3.09	3.45	A.
October	1,900	163	600	2.10	2.42	A.
November	1,300	180	447	1.56	1.74	A.
December	1,210		449	1.57	1.81	B.
The year	18,100	9	788	2.76	37.40	

[a] Discharge for periods of probable ice conditions has been estimated from study of climatologic data and comparisons with other stations.

	Second-feet.
Mean discharge, Jan. 9 to 31, estimated	164
Mean discharge, Dec. 18 to 31, estimated	217

COLD STREAM AT ENFIELD.

Cold Stream is the outlet from Cold Stream Pond—really a series of ponds comprising a total area of water surface of about 10 square miles, the largest, which is mostly in the town of Enfield, having about 8 square miles area.

Cold Stream flows into Passadumkeag Stream, a tributary of the Penobscot, at a distance of some 4½ miles from Cold Stream Pond, and drains a total area comprising about 37 square miles. Its basin is for the most part wooded and only sparsely settled. During the first half mile the stream falls rapidly, but for the rest of its course it traverses a great swamp, through which it winds with sluggish current. Near the village of Enfield a fall of perhaps 10 to 12 feet has in the past been developed for power for a sawmill and shingle mill but is not now in use. This drainage basin has been considered as a source of water supply for the district which includes Bangor and some other adjacent towns.

This station, which was established June 14, 1904, and discontinued December 31, 1906, was located at the highway bridge about three-fourths of a mile south of Enfield on the road to Passadumkeag. During the summer it was found that the gage was within the influence of backwater from Passadumkeag Stream, and consequently, on September 12, 1904, the gage was removed to a point about 200 feet below the old mill, near Enfield post office. The drainage area at this point is about 26 square miles.

Discharge measurements of Cold Stream at Enfield, 1904–1906.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
1904.	*Feet.*	*Sec.-ft.*	1905—Continued.	*Feet.*	*Sec.-ft.*
Sept. 9	2.72	36	May 26	2.78	55
Oct. 12	2.75	37	Do	2.78	42
Oct. 21	2.92	56	June 24	2.80	52
Nov. 4	2.90	54	Oct. 23	2.68	21.3
			Nov. 28	2.64	15.9
1905.					
Apr. 28	2.68	22.6	1906.		
May 3	3.33	168	Feb. 24	2.66	17
May 8	2.63	29.3	Apr. 13	3.04	77
May 26	2.78	52	Apr. 30	3.10	83

Daily gage height, in feet, of Cold Stream at Enfield, 1904–1906.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1904.					1904.				
1	....	2.9	2.9	2.6	17	2.9	3.0	2.7	2.7
2	....	2.9	2.8	2.7	18	2.9	3.0	2.9	2.7
3	....	2.9	2.8	2.7	19	2.8	3.0	2.8	2.6
4	....	2.9	3.0	2.7	20	2.8	3.0	2.7	2.7
5	....	3.0	2.8	2.8	21	2.8	2.8	2.8	2.6
6	....	2.8	2.8	2.8	22	2.8	3.0	2.8	2.7
7	....	2.8	2.8	2.7	23	2.8	3.0	2.7	2.7
8	....	2.8	2.8	2.7	24	2.9	3.0	2.6	2.7
9	....	2.9	2.8	2.7	25	2.9	3.0	2.7	2.6
10	2.4	2.8	2.8	2.8	26	2.8	3.0	2.8	2.6
11	2.8	2.5	2.8	2.7	27	2.8	3.0	2.8	2.7
12	2.8	2.7	2.8	2.8	28	2.8	3.0	2.8	2.7
13	2.7	2.7	2.7	2.8	29	2.8	3.0	2.7	2.6
14	2.7	2.7	2.7	2.7	30	3.0	3.0	2.6	2.7
15	2.9	2.7	2.7	2.6	31	....	3.0	....	2.6
16	2.9	2.8	2.7	2.6					

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1	2.6	2.7	2.8	2.9	3.9	2.8	2.7	2.7	2.5	2.7	2.6	2.7
2	2.6	2.8	2.7	2.8	3.6	2.7	2.7	2.6	2.5	2.7	2.6	2.6
3	2.7	2.7	2.8	2.8	3.4	2.7	2.8	2.6	2.6	2.7	2.7	2.6
4	2.7	2.7	2.6	2.9	3.4	2.8	2.8	2.5	2.6	2.6	2.7	2.6
5	2.6	2.7	2.6	2.9	3.1	2.8	2.8	2.5	2.7	2.6	2.7	2.6
6	2.6	2.7	2.6	3.0	2.9	2.8	2.8	2.5	2.6	2.7	2.7	2.6
7	2.6	2.7	2.8	3.0	2.7	2.8	2.7	2.5	2.6	2.7	2.7	2.7
8	2.8	2.7	2.8	2.8	2.6	2.8	2.7	2.5	2.8	2.6	2.6	2.7
9	2.8	2.7	2.7	2.7	2.6	2.8	2.8	2.5	2.8	2.6	2.6	2.7
10	2.7	2.7	2.7	2.7	3.0	2.8	2.8	2.5	2.8	2.6	2.6	2.6
11	2.7	2.7	2.8	2.7	3.2	2.8	2.8	2.5	2.8	2.6	2.7	[a] 2.9
12	2.7	2.7	2.8	2.7	3.2	2.7	2.8	2.4	2.8	2.7	2.7	2.8
13	2.7	2.7	2.7	2.7	3.1	2.8	2.8	2.4	2.8	2.7	2.6	2.6
14	2.6	2.7	2.7	2.6	3.1	2.7	2.9	2.4	2.8	2.7	2.6	2.6
15	2.6	2.8	2.7	2.7	3.0	2.8	2.9	2.4	2.7	2.7	2.7	2.6
16	2.6	2.7	2.7	2.7	3.0	2.8	2.8	2.5	2.7	2.7	2.7	2.6
17	2.8	2.7	2.6	2.7	2.7	2.7	2.7	2.5	2.7	2.6	2.7	2.6
18	2.8	2.7	2.6	2.6	2.7	2.7	2.8	2.5	2.7	2.6	2.7	2.6
19	2.7	2.7	2.7	2.6	2.6	2.8	2.8	2.5	2.8	2.6	2.6	2.6
20	2.8	2.7	2.7	2.7	2.7	2.8	2.8	2.5	2.8	2.6	2.6	2.6
21	2.9	2.7	2.7	2.6	2.7	2.8	2.8	2.5	2.8	2.7	2.6	2.7
22	2.8	2.7	2.8	2.6	2.7	2.9	2.9	2.5	2.7	2.6	2.6	2.7
23	2.7	2.7	2.8	2.7	2.7	2.9	2.8	2.5	2.7	2.6	2.6	2.6
24	2.7	2.7	2.7	2.6	2.8	2.9	2.8	2.5	2.7	2.6	2.6	2.6
25	2.7	2.7	2.7	2.6	2.8	2.8	2.9	2.5	2.7	2.7	2.6	2.6

[a] River was frozen Dec. 11–13; ice reached a thickness of 0.3 foot.

Daily gage height, in feet, of Cold Stream at Enfield, 1904–1906—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
26	2.6	2.7	2.8	2.6	2.7	2.8	2.8	2.5	2.7	2.7	2.6	2.6
27	2.6	2.6	2.7	2.7	2.8	2.8	2.8	2.6	2.8	2.6	2.6	2.6
28	2.7	2.6	2.6	2.8	2.8	2.8	2.9	2.5	2.8	2.7	2.7	2.6
29	2.7	......	2.7	3.6	2.8	2.8	2.8	2.5	2.8	2.7	2.7	2.6
30	2.6	......	2.8	3.7	2.8	2.8	2.7	2.5	2.8	2.7	2.7	2.6
31	2.6	......	2.8	......	2.8	......	2.6	2.5	......	2.7	......	2.6
1906.												
1	2.6	2.7	2.6	2.8	3.1	3.2	3.0	2.8	2.7	2.8	2.6	2.6
2	2.4	2.7	2.7	2.8	3.1	3.2	3.0	2.8	2.7	2.8	2.6	2.6
3	2.6	2.6	2.7	2.8	3.1	3.1	3.0	2.8	2.7	2.9	2.6	2.6
4	2.6	2.6	2.7	2.8	3.1	3.1	3.1	2.8	2.8	2.8	2.6	2.6
5	2.6	2.6	2.6	2.7	3.2	3.2	3.1	2.9	2.8	2.8	2.6	[a] 4.0
6	2.5	2.6	2.6	2.9	3.2	3.2	3.1	2.9	2.7	2.7	2.7	[a] 2.9
7	2.6	2.6	2.7	2.9	3.2	3.2	3.0	2.9	2.7	2.7	2.7	2.7
8	2.6	2.5	2.7	3.0	3.2	3.2	3.0	2.8	2.7	2.7	2.7	2.7
9	2.6	2.7	2.7	2.9	3.1	3.2	3.0	2.8	2.7	2.7	2.7	2.6
10	2.6	2.7	2.7	3.0	3.1	3.4	3.0	2.8	2.7	2.8	2.7	2.6
11	2.6	2.7	2.6	2.9	3.0	3.9	3.0	2.8	2.7	2.7	2.6	2.7
12	2.7	2.7	2.6	2.9	3.0	3.8	3.0	2.8	2.7	2.7	2.6	2.7
13	2.7	2.6	2.6	3.3	3.1	3.8	3.0	2.8	2.7	2.7	2.7	2.6
14	2.7	2.7	2.6	3.0	3.1	3.8	3.0	2.8	2.7	2.7	2.7	2.7
15	2.7	2.7	2.5	3.0	3.1	3.7	3.0	2.8	2.7	2.7	2.7	2.7
16	2.6	2.7	2.5	3.0	3.2	3.6	3.1	2.7	2.7	2.6	2.7	2.7
17	2.7	2.7	2.5	3.3	3.3	3.7	3.1	2.7	2.8	2.8	2.7	2.7
18	2.7	2.7	2.7	3.1	3.3	3.7	3.0	2.7	2.7	2.8	2.7	2.7
19	2.6	2.7	2.7	2.9	3.4	3.6	3.0	2.7	2.7	2.8	2.7	2.6
20	2.6	2.7	2.7	2.9	3.4	3.6	3.0	2.8	2.8	2.7	2.7	2.6
21	2.7	2.6	2.7	2.9	3.4	3.4	3.0	2.8	2.7	2.7	2.8	2.6
22	2.7	2.7	2.5	2.9	3.3	3.1	3.0	2.8	2.8	2.6	2.8	2.8
23	2.7	2.7	2.6	3.3	3.3	3.0	3.0	2.8	2.8	2.6	2.8	2.8
24	2.6	2.7	2.7	3.3	3.2	3.0	2.9	2.8	2.8	2.7	2.8	2.8
25	2.6	2.7	2.7	3.3	3.2	3.1	2.9	2.8	2.8	2.7	2.7	2.7
26	2.7	2.7	2.7	3.1	3.2	3.1	2.9	2.8	2.8	2.6	2.7	2.7
27	2.7	2.6	2.6	3.1	3.2	3.1	2.9	2.8	2.8	2.7	2.7	2.6
28	2.6	2.6	2.6	3.1	3.2	3.2	2.8	2.7	2.8	2.8	2.7	2.6
29	2.6	2.6	2.8	3.1	3.2	3.2	2.8	2.7	2.8	2.7	2.7	2.7
30	2.6	......	2.7	3.1	3.2	3.1	2.8	2.8	2.8	2.7	2.6	2.7
31	2.6	......	2.7	......	3.1	......	2.8	2.8	......	......	......	2.8

[a] Backwater from anchor ice on riffles below station.

NOTE.—Ice does not usually form at this station. It sometimes forms to a thickness of 0.2 foot during the night but invariably goes out during the day. The following thicknesses of ice were obtained: Feb. 3, 2 inches; Feb. 15, 2 inches; Mar. 12, 2 inches; Mar. 13, 1 inch; Mar. 23, 2 inches.

Rating table for Cold Stream at Enfield, 1904–1906.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
2.40	2	2.90	52	3.40	158	3.90	316
2.50	6	3.00	69	3.50	186	4.00	353
2.60	12	3.10	88	3.60	216		
2.70	24	3.20	109	3.70	248		
2.80	37	3.30	132	3.80	281		

NOTE.—The above table is applicable only for open-channel conditions. It is based on 8 discharge measurements made during 1904–1906 and is fairly well defined between gage heights 2.6 feet and 3.2 feet. Below gage height 2.6 feet it is very uncertain.

Daily discharge, in second-feet, of Cold Stream at Enfield, 1904-1906.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1904.					1904.				
1	....	52	52	12	17	52	69	24	24
2	....	52	37	24	18	52	69	52	24
3	....	52	37	24	19	37	69	37	12
4	....	52	69	24	20	37	69	24	24
5	....	69	37	37	21	37	37	37	12
6	....	37	37	37	22	37	69	37	24
7	....	37	37	24	23	37	69	24	24
8	....	37	37	24	24	52	69	12	24
9	....	52	37	24	25	52	69	24	12
10	2	37	37	37	26	37	69	37	12
11	37	6	37	24	27	37	69	37	24
12	37	24	37	37	28	37	69	37	24
13	24	24	24	37	29	37	69	24	12
14	24	24	24	24	30	69	69	12	24
15	52	24	24	12	31	....	69	....	12
16	52	37	24	12					

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1	12	24	37	52	316	37	24	24	6	24	12	24
2	12	37	24	37	216	24	24	12	6	24	12	12
3	24	24	37	37	158	24	37	12	12	24	24	12
4	24	24	12	52	158	37	37	6	12	12	24	12
5	12	24	12	52	88	37	37	6	24	12	24	12
6	12	24	12	69	52	37	37	6	12	24	24	12
7	12	24	37	69	24	37	24	6	12	24	24	24
8	37	24	37	37	12	37	24	6	37	12	12	24
9	37	24	24	24	12	37	37	6	37	12	12	24
10	24	24	24	24	69	37	37	6	37	12	12	12
11	24	24	37	24	109	37	37	6	37	12	24	[a] 10
12	24	24	37	24	109	24	37	2	37	24	24	[a] 10
13	24	24	24	24	88	37	37	2	37	24	12	12
14	12	24	24	12	88	24	52	2	37	24	12	12
15	12	37	24	24	69	37	52	2	24	24	24	12
16	12	24	24	24	69	37	37	6	24	24	24	12
17	37	24	12	24	24	24	24	6	24	12	24	12
18	37	24	12	12	24	24	37	6	24	12	24	12
19	24	24	24	12	12	37	37	6	37	12	12	12
20	37	24	24	24	24	37	37	6	37	12	12	12
21	52	24	24	12	24	37	37	6	37	24	12	24
22	37	24	37	12	24	52	52	6	24	12	12	24
23	24	24	37	24	24	52	37	6	24	12	12	12
24	24	24	24	12	37	52	37	6	24	12	12	12
25	24	24	24	12	37	37	52	6	24	24	12	12
26	12	24	37	12	24	37	37	6	24	24	12	12
27	12	12	24	24	37	37	37	12	37	12	12	12
28	24	12	12	37	37	37	52	6	37	24	24	12
29	24	....	24	216	37	37	37	6	37	24	24	12
30	12	....	37	248	37	37	24	6	37	24	24	12
31	12	....	37	....	37	....	12	6	....	24	....	12
1906.												
1	12	24	12	37	88	109	69	37	24	37	12	12
2	2	24	24	37	88	109	69	37	24	37	12	12
3	12	12	24	37	88	88	69	37	24	52	12	12
4	12	12	24	37	88	88	88	37	37	37	12	12
5	12	12	12	24	109	109	88	52	37	37	12	[b] 12
6	6	12	12	52	109	109	88	52	24	24	24	[b] 24
7	12	12	24	52	109	109	69	52	24	24	24	24
8	12	6	24	69	109	109	69	37	24	24	24	24
9	12	24	24	52	88	109	69	37	24	24	24	12
10	12	24	24	69	88	158	69	37	24	37	24	12
11	12	24	12	52	69	316	69	37	24	24	12	24
12	24	24	12	52	69	281	69	37	24	24	12	24
13	24	12	12	132	88	281	69	37	24	24	24	12
14	24	24	12	69	88	281	69	37	24	24	24	24
15	24	24	6	69	88	248	69	37	24	24	24	24

[a] River frozen. Discharge estimated.

[b] Discharge corrected for backwater effect.

Daily discharge, in second-feet, of Cold Stream at Enfield, 1904–1906—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1906.												
16	12	24	6	69	109	216	88	24	24	12	24	24
17	24	24	6	132	132	248	88	24	37	37	24	24
18	24	24	24	88	132	248	69	24	24	37	24	24
19	12	24	24	52	158	216	69	24	24	37	24	12
20	12	24	24	52	158	216	69	37	37	24	24	12
21	24	12	24	52	158	158	69	37	24	24	37	12
22	24	24	6	52	132	88	69	37	37	12	37	37
23	24	24	12	132	132	69	60	37	37	12	37	37
24	12	24	24	132	109	69	52	37	37	24	37	37
25	12	24	24	132	109	88	52	37	37	24	24	24
26	24	24	24	88	109	88	52	37	37	12	24	24
27	24	12	12	88	109	88	52	37	37	24	24	12
28	12	12	12	88	109	109	37	24	37	37	24	12
29	12	....	37	88	109	109	37	24	37	24	24	24
30	12	....	24	88	109	88	37	37	37	24	12	24
31	12	....	24	....	88	....	37	37	....	[a] 18	....	37

[a] No record; discharge interpolated.

Monthly discharge of Cold Stream at Enfield, 1904–1906.

[Drainage area, 26 square miles.]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).
	Maximum.	Minimum.	Mean.	Per square mile.	
1904.					
Sept. 10–30	69	2	39.9	1.53	1.19
October	69	6	53.2	2.05	2.36
November	69	12	33.5	1.29	1.44
December	37	12	22.6	.869	1.00
1905.					
January	52	12	22.8	.877	1.01
February	37	12	24.1	.927	.97
March	37	12	26.3	1.01	1.16
April	248	12	42.2	1.62	1.81
May	316	12	66.5	2.56	2.95
June	52	24	35.9	1.38	1.54
July	52	12	36.1	1.39	1.60
August	24	2	6.65	.256	.30
September	37	6	27.3	1.05	1.17
October	24	12	19.0	.731	.84
November	24	12	17.6	.677	.76
December [a]	24	10	13.7	.527	.61
The year	316	2	28.2	1.08	14.72
1906.					
January	24	2	15.7	.604	.70
February	24	6	19.5	.750	.78
March	37	6	11.8	.454	.52
April	132	24	72.4	2.78	3.10
May	158	69	107	4.12	4.75
June	316	69	153	5.88	6.56
July	88	37	65.7	2.53	2.92
August	52	24	35.9	1.38	1.59
September	37	24	29.6	1.14	1.27
October	52	12	26.9	1.03	1.19
November	37	12	22.5	.865	.97
December [b]	37	12	20.6	.792	.91
The year	316	2	48.4	1.86	25.26

[a] River frozen Dec. 11 to 13, 1905; discharge estimated 10 second-feet.

[b] Backwater Dec. 5 and 6; discharge corrected.

NOTE.—Values 1904 to 1906 approximated, owing to local changes in control which could not be covered by meter measurements.

KENDUSKEAG STREAM NEAR BANGOR.

This station, which was established September 15, 1908, is located at the wooden highway bridge about 6 miles northwest of Bangor. It is just below Sixmile Falls, which affords the best unutilized power site on the lower stretch of the river.

The discharge at the station does not represent the actual discharge from the natural drainage basin of Kenduskeag Stream. A number of years ago an artificial cut for log driving was made through a low divide between Souadabscook Stream and Black Stream, the latter tributary to the Kenduskeag about 7 miles above the gaging station. During high stages in the Souadabscook a part of its water passes through the artificial cut into Kenduskeag; at low stages in the Souadabscook all of the flow continues down its own channel. It is believed that all of the flow of Black Stream is into the Kenduskeag and none into the Souadabscook. The drainage area of Kenduskeag Stream above the mouth of Black Stream is 136 square miles; at the gaging station, including all of Black Stream but none of Souadabscook, it is 191 square miles; at the mouth under the same conditions, it is 214 square miles. The drainage area of Black Stream itself is 40 square miles. The monthly discharge data show the conditions actually existing at the station. The estimates of discharge per square mile and the depth in inches on the drainage area are not absolutely accurate because of the conditions outlined above. The part of the area of the Souadabscook Basin that contributes to the flow of the Kenduskeag can not be determined.

The datum of the gage has remained unchanged during the maintenance of the station. During the winter months the flow of the stream is somewhat affected by ice. Conditions for obtaining accurate discharge data are good and a good rating curve has been developed, although more measurements are needed at higher stages.

Discharge measurements of Kenduskeag Stream near Bangor, 1908–9.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
1908.	*Feet.*	*Second-feet.*	1909.	*Feet.*	*Second-feet.*
Apr. 25	4.13	656	Apr. 21	5.42	1,420
Do.[a]	([b])	770	May 24	2.40	148
July 9[a]	([c])	28.6	Sept. 20	1.45	13.5
July 9	1.71	29.8			
Sept. 4	1.52	21.3			
Sept. 15	1.31	7.2			
Dec. 11	2.98	94.9			
Dec. 24	[d]2.08	40.1			

[a] Gaging made from upstream side of highway bridge at East Bangor.
[b] Distance to water surface from the top of floor beam, 100 feet; from left abutment, 15.19 feet.
[c] Distance to water surface from the top of floor beam, 100 feet; from left abutment, 16.77 feet.
[d] Gage height to top of ice, 2.14 feet; average thickness of ice, 0.58 foot.

Daily gage height, in feet, of Kenduskeag Stream near Bangor, 1908–9.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1908.					1908.				
1	....	1.3	2.5	2.2	16	1.3	1.5	2.4	3.05
2	....	1.5	2.6	2.2	17	1.3	1.5	2.9	3.25
3	....	1.55	2.65	2.1	18	1.3	1.6	2.9	3.2
4	....	1.55	2.6	2.2	19	1.3	1.55	2.65	3.25
5	....	1.45	2.5	2.2	20	1.3	1.5	2.35	....
6	....	1.4	2.4	2.3	21	1.3	1.5	2.05	....
7	....	1.4	2.3	2.4	22	1.3	1.6	1.95	2.1
8	....	1.4	2.2	2.4	23	1.3	1.6	2.1	2.0
9	....	1.5	2.0	a2.65	24	1.3	1.6	2.2	2.0
10	....	1.5	2.0	2.9	25	1.3	1.6	2.2	2.2
11	....	1.65	2.0	2.9	26	1.3	1.6	2.4	2.25
12	....	1.5	2.0	2.9	27	1.3	1.85	2.4	2.1
13	....	1.4	1.9	2.9	28	1.3	2.15	2.4	2.1
14	....	1.4	1.9	2.95	29	1.3	2.2	2.4	2.1
15	1.3	1.4	1.9	3.0	30	1.3	2.2	2.35	2.1
					31	....	2.5	....	2.2

a Ice conditions prevailed from about Dec. 9 to 26.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1	....	....	....	8.3	4.8	2.6	1.9	1.65	1.35	8.2	2.85	4.2
2	....	....	....	8.3	4.95	2.4	1.9	1.55	1.35	5.8	2.7	4.05
3	2.2	....	....	6.9	5.2	2.4	1.9	1.55	1.35	4.65	3.85	4.0
4	2.2	....	....	6.4	5.2	2.3	1.9	1.55	1.45	4.1	4.7	3.95
5	2.2	....	....	6.3	5.0	2.35	1.8	1.55	1.55	3.75	4.5	3.75
6	2.45	....	....	6.85	4.8	2.2	1.8	1.55	1.55	3.55	4.1	3.7
7	6.65	3.7	5.5	7.35	4.55	2.2	1.8	1.55	1.65	3.3	3.65	3.8
8	6.6	....	....	8.1	4.25	2.1	1.8	1.55	1.65	3.05	3.3	3.9
9	6.05	....	....	8.1	4.2	2.0	1.8	1.55	1.65	2.75	3.2	3.4
10	5.0	....	....	7.4	4.25	1.9	1.9	1.55	1.65	2.55	3.2	2.95
11	4.8	....	....	6.4	4.65	1.9	1.8	1.55	1.65	2.5	3.35	3.05
12	4.6	....	....	6.3	4.8	1.9	1.8	1.55	1.65	2.6	3.25	3.3
13	4.45	....	5.3	7.7	4.6	1.8	1.8	1.55	1.55	2.6	3.05	3.45
14	4.4	4.2	....	8.6	4.3	1.85	1.75	1.55	1.55	2.5	3.0	3.4
15	4.4	....	....	9.65	3.9	1.9	1.7	1.55	1.45	2.4	3.0	3.3
16	....	....	....	10.0	3.45	1.8	1.7	1.55	1.45	2.35	2.9	3.75
17	a4.4	....	....	9.3	3.2	2.05	1.8	1.65	1.45	2.65	2.95	3.8
18	....	....	....	7.75	3.15	2.25	1.9	1.65	1.45	2.55	3.3	3.7
19	....	....	....	6.8	3.15	2.35	2.4	1.75	1.55	2.4	3.3	3.7
20	....	....	....	6.55	3.3	2.5	2.5	1.75	1.55	2.25	3.2	3.8
21	....	6.0	6.6	5.9	3.25	2.6	2.5	1.75	1.5	2.15	3.05	3.7
22	....	....	6.4	5.4	3.05	2.55	2.35	1.75	1.5	2.25	2.85	3.45
23	....	....	6.0	5.8	3.0	2.4	2.25	1.65	1.5	2.35	3.0	2.9
24	a3.6	....	6.0	5.8	2.6	2.3	2.05	1.65	1.5	2.6	3.0	3.0
25	....	....	6.45	4.9	2.6	2.2	1.9	1.55	1.5	2.7	3.35	3.0
26	....	....	6.8	4.6	2.55	2.1	1.85	1.55	1.7	3.15	4.8	2.75
27	....	....	6.85	4.5	2.9	2.0	1.75	1.45	3.1	3.45	5.6	2.75
28	....	6.0	7.0	4.2	2.65	2.0	1.75	1.45	5.15	3.5	5.3	2.75
29	....	....	7.75	4.5	2.9	1.9	1.75	1.45	7.8	3.7	4.9	2.65
30	3.6	....	8.4	4.7	2.75	1.9	1.75	1.45	9.2	3.55	4.55	2.55
31	....	....	8.9	....	2.6	....	1.65	1.35	....	3.15	....	2.5

a Gage height to top of ice.

NOTE.—Ice conditions existed from Jan. 15 to Apr. 2. Gage heights Mar. 21 to Apr. 2 were probably affected by backwater from ice jams below.

Rating table for Kenduskeag Stream near Bangor, 1908–9.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1.30	7	2.70	214	4.10	665	6.00	1,820
1.40	12	2.80	239	4.20	707	6.20	1,985
1.50	18	2.90	265	4.30	751	6.40	2,155
1.60	2	3.00	292	4.40	797	6.60	2,330
1.70	34	3.10	320	4.50	845	6.80	2,510
1.80	45	3.20	349	4.60	895	7.00	2,690
1.90	58	3.30	379	4.70	945	7.20	2,880
1.00	72	3.40	410	4.80	1,000	7.40	3,070
2.10	88	3.50	442	4.90	1,055	7.60	3,265
2.20	105	3.60	476	5.00	1,115	7.80	3,465
2.30	124	3.70	511	5.20	1,240	8.00	3,665
2.40	145	3.80	547	5.40	1,370	9.00	4,705
2.50	167	3.90	585	5.60	1,510	10.00	5,805
2.60	190	4.00	624	5.80	1,660		

NOTE.—The above table is not applicable for ice or obstructed channel conditions. It is based on 6 discharge measurements made during 1908–9 and is well defined between gage heights 0.3 feet and 6.0 foot.

Daily discharge, in second-feet, of Kenduskeag Stream near Bangor, 1908–9.

Day.	Sept.	Oct.	Nov.	Dec.	Day.	Sept.	Oct.	Nov.	Dec.
1908.									
1	....	7	167	105	16	7	18	145	80
2	....	18	190	105	17	7	18	265	80
3	....	22	202	88	18	7	25	265	80
4	....	22	190	105	19	7	22	202	80
5	....	15	167	105	20	7	18	134	60
6	....	12	145	124	21	7	18	80	60
7	....	12	124	145	22	7	25	65	60
8	....	12	105	145	23	7	25	88	40
9	....	18	72	[a] 120	24	7	25	105	40
10	....	18	72	100	25	7	25	105	60
11	....	30	72	95	26	7	25	145	114
12	....	18	72	90	27	7	52	145	88
13	....	12	58	90	28	7	96	145	88
14	....	12	58	90	29	7	105	145	88
15	7	12	58	90	30	7	105	134	88
					31	....	167	....	105

[a] Discharge for period of ice conditions, Dec. 9 to 26, estimated on basis of two measurements during that period.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.[a]												
1	105	....	....	....	1,000	190	58	30	9.5	3,860	252	707
2	105	....	....	....	1,080	145	58	22	9.5	1,660	214	644
3	105	....	....	2,600	1,240	145	58	22	9.5	920	566	624
4	105	....	....	2,160	1,240	124	58	22	9.5	665	945	604
5	105	....	....	2,070	1,120	134	45	22	15	529	845	529
6	156	....	....	2,560	1,000	105	45	22	22	459	665	511
7	2,380	....	....	3,020	870	105	45	22	30	379	494	547
8	2,330	....	....	3,760	729	88	45	22	30	306	379	585
9	1,860	....	....	3,760	707	72	45	22	30	226	349	410
10	1,120	....	....	3,070	729	58	58	22	30	178	349	278
11	1,000	....	....	1,160	920	58	45	22	30	167	394	306
12	895	....	....	2,070	1,000	58	45	22	30	190	364	379
13	821	....	....	3,360	895	45	45	22	22	190	306	426
14	797	....	....	4,280	751	52	40	22	22	167	292	410
15	....	....	....	5,420	585	58	34	22	15	145	292	379

[a] Assumed that backwater conditions existed from Mar. 29 to Apr. 2, 1909. Mar. 21 to 28 may have been affected also. Discharge Mar. 21 to Apr. 2 estimated to be about 85 per cent of the normal flow for period Mar. 21 to 28. Estimates Jan. 15 to Mar. 20 are very approximate.

Daily discharge, in second-feet, of Kenduskeag Stream near Bangor, 1908-9—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1909.												
16				5,800	426	45	34	22	15	134	265	529
17				5,040	349	80	45	30	15	202	278	547
18				3,420	334	114	58	30	15	178	379	511
19				2,510	334	134	145	40	22	145	379	511
20				2,280	379	167	167	40	22	114	349	547
21				1,740	364	190	167	40	18	96	306	511
22				1,370	306	178	134	40	18	114	252	426
23				1,660	292	145	114	30	18	134	292	265
24				1,660	190	124	80	30	18	190	292	292
25				1,060	190	106	58	22	18	214	394	292
26				895	178	88	52	22	34	334	1,000	226
27				845	265	72	40	15	320	426	1,510	226
28				707	202	72	40	15	1,210	442	1,300	226
29				845	265	58	40	15	3,460	511	1,060	202
30				945	226	58	40	15	4,920	459	870	178
31					190		30	9.5		334		167

Monthly discharge of Kenduskeag River near Bangor, 1908-9.

[Drainage area, 191 square miles.[a]]

Month.	Discharge in second-feet.				Run-off (depth in inches on drainage area).	Accuracy.
	Maximum.	Minimum.	Mean.	Per square mile.		
1908.						
Sept. 15-30	7	7	7	0.037	0.01	A.
October	167	7	32.5	.170	.20	A.
November	265	58	131	.686	.77	A.
December	145		90.6	.475	.55	B.
1909.						
January	2,380		538	2.82	3.25	C.
February			2.72	1.42	1.48	D.
March			984	5.15	5.94	D.
April	5,800	707	2,500	13.1	14.62	C.
May	1,240	178	592	3.10	3.57	B.
June	190	45	102	.534	.60	A.
July	167	30	63.5	.332	.38	A.
August	40	9.5	24.3	.127	.15	A.
September	4,920	9.5	348	1.82	2.03	A.
October	3,860	96	454	2.38	2.74	A.
November	1,510	214	521	2.73	3.05	A.
December	707	167	419	2.19	2.52	B.
The year	5,800	9.5	568	2.97	40.33	

[a] Does not include any of the Souadabscook drainage area.

NOTE.—Discharge estimated for periods of ice conditions in December, 1908, and January to April, 1909. Discharge estimated for Dec. 9 to 26, 1908, is equivalent to 77 second-feet per day. For Jan. 15 to 31, 1909, equivalent to 282 second-feet per day.

PHILLIPS LAKE AND OUTLETS IN HOLDEN AND DEDHAM.

Phillips Lake, situated about 10 miles southeast of Bangor, receives the drainage from an area 11.5 square miles in extent and has a water surface of about 1.4 square miles. The shores of the lake are in most places rocky, and most of the adjacent country is wooded and but sparsely settled.

The lake has two outlets. The greater flow is from the north end of the lake northward through the village of East Holden, thence southward through Long Pond and into Penobscot River below

Bucksport, a total length of 18 miles. The other stream flows from the southeast end of the lake, in the town of Dedham, into Green Lake and thence into Union River; this outlet carries water only during medium and high stages. Gages have been maintained at the outlets of the lake and on the lake itself for the purpose of determining the quantity of water available for public use, as the lake was for some time under consideration as a source of water supply for the city of Bangor.

The gage at the northern outlet was established July 7, 1904, and discontinued July 1, 1908. It is located about 1¼ miles from the lake, one-quarter mile south of the village of East Holden, and 175 feet south of an old mill. The drainage area at this point is 12.3 square miles.

The gage at the southeast outlet was established July 19, 1904, and was read only at the time of visits by the hydrographers. It is located at the highway bridge about 1½ miles southeast of Lake House railroad station and is about 700 feet southeast of the Maine Central Railroad crossing. The flow through this outlet is proportional to the lake height.

The gage on Phillips Lake was established July 19, 1904, and discontinued July 1, 1908. It was originally located at a point on the east shore of the lake about 300 feet northwest of Dr. L. S. Chilcott's cottage. On December 6, 1904, its location was changed to the Maine Central Railroad bridge over the north end of Phillips Lake, being still referred to the same datum.

The respective gage datums have remained the same during the maintenance of the stations.

Conditions for obtaining accurate data at the two outlets are rather poor and the results are only approximate. The discharge is probably not materially affected by ice.

Discharge measurements of Phillips Lake outlet, at East Holden, 1904–1908.

Date.	Gage height.	Discharge.	Date.	Gage height.	Discharge.
1904.	*Feet.*	*Sec.-ft.*	1906.	*Feet.*	*Sec.-ft.*
July 19	1.55	9.66	Feb. 23	2.38	59
Aug. 18	1.45	6.29	Mar. 5	2.34	46
Oct. 17	1.46	5.64	Apr. 14	2.34	44
			Apr. 27	2.28	40
1905.			May 23	2.52	52
Apr. 17	1.84	24.2	Aug. 24	1.85	17.2
Apr. 29[a]	1.90	27.2			
May 25[a]	1.90	30.7	1907.		
June 17	1.82	21.5	Dec. 16	2.18	18.7
Aug. 11	1.77	15.0			
Aug. 15	1.67	11.0	1908.		
Sept. 2	1.74	12.6	Apr. 24	[b] 2.43	37.7
Oct. 21	1.41	1.8			

[a] From log across stream 100 feet below gauge.

[b] Gage height varied from 2.18 feet to 2.68 feet during the measurement.

Discharge measurements of Phillips Lake, southeast outlet, near Lake House railroad station, 1904–1908.

Date.	Gage height.		Discharge.	Date.	Gage height.		Discharge.
	Outlet.	Phillips Lake.			Outlet.	Phillips Lake.	
1904.	*Feet.*	*Feet.*	*Sec.-ft.*	1906.	*Feet.*	*Feet.*	*Sec.-ft.*
July 19	1.42	7.05	1.09	Feb. 23	1.50	7.55	1.69
Aug. 18	1.14	6.40	.07	Mar. 5	1.94	7.25	1.21
Oct. 17	1.49	7.34	1.48	Apr. 27	2.90	9.35	44.2
				May 23	2.20	8.80	13.5
1905.				Aug. 24	1.15	6.05	.01
Apr. 17	2.80	9.40	42.7				
Apr. 29	2.28	8.94	12.2	1907.			
May 25	2.20	8.97	11.9	Dec. 16	2.50	9.05	24.5
June 17	1.62	8.48	3.3				
Aug. 11	1.38	7.37	1.25	1908.			
Aug. 15	1.35	7.20	1.04	Apr. 24	1.92	8.65	5.2
Sept. 2	1.06	6.40	.05				
Oct. 21	1.10	6.00	.03				

Daily gage height, in feet, of Phillips Lake, north outlet, at East Holden, 1904–1908.

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.							1904.						
1	......	1.70	1.45	(a)	1.45	1.80	16	1.50	1.40	1.40	......	1.45	1.65
2	......	1.70	1.50	......	1.45	1.90	17	1.50	1.40	1.40	1.45	1.45	1.65
3	......	1.65	1.48	......	1.45	2.00	18	1.50	1.40	1.40	1.45	1.45	1.65
4	......	1.65	1.45	......	1.45	1.80	19	1.52	1.40	1.40	1.45	1.45	1.70
5	......	1.65	1.45	......	1.45	1.70	20	1.55	1.40	1.40	1.45	1.45	1.65
6	......	1.60	1.45	......	1.45	1.70	21	1.52	1.62	1.40	1.45	1.50	1.70
7	1.60	1.60	1.45	......	1.45	1.70	22	1.50	1.50	1.40	1.45	1.50	1.75
8	1.60	1.60	1.45	......	1.45	1.70	23	1.50	1.48	1.40	1.45	1.50	1.70
9	1.60	1.60	1.45	......	1.45	1.70	24	1.50	1.45	1.40	1.45	1.55	1.60
10	1.60	1.55	1.42	......	1.45	1.65	25	1.50	1.45	1.40	1.45	1.60	1.65
11	1.60	1.55	1.40	......	1.45	1.65	26	1.50	1.45	1.40	1.45	1.65	1.65
12	1.60	1.55	1.40	......	1.45	1.65	27	1.55	1.45	1.40	1.45	1.70	1.65
13	1.60	1.48	1.40	......	1.45	1.70	28	1.70	1.45	1.40	1.45	1.75	1.70
14	1.55	1.45	1.40	......	1.45	1.70	29	1.70	1.48	1.40	1.45	1.75	1.65
15	1.50	1.40	1.40	......	1.45	1.65	30	1.70	1.45	1.40	1.45	1.75	1.65
							31	1.70	1.45	......	1.45	......	1.65

a No gage readings Oct. 1–16.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.[a]												
1	1.6	1.75	1.6	2.05	1.9	1.9	1.85	1.55	1.8	1.4	1.7	1.5
2	1.6	1.75	1.6	1.8	1.9	1.9	1.9	1.55	1.8	1.4	1.5	1.5
3	1.6	1.75	1.6	1.8	1.85	1.9	1.9	1.55	1.8	1.4	1.5	1.7
4	1.6	1.75	1.6	1.85	1.95	1.9	1.9	1.55	1.8	1.4	1.5	1.7
5	1.7	1.75	1.6	1.9	1.9	1.9	1.7	1.55	1.8	1.4	1.5	1.55
6	1.7	1.7	1.6	2.2	1.95	2.0	1.7	1.55	1.6	1.4	1.5	1.55
7	1.7	1.7	1.6	2.2	1.9	1.9	1.5	1.8	1.5	1.4	1.5	1.55
8	2.7	1.7	1.55	2.1	1.9	1.9	1.5	1.85	1.45	1.4	1.55	1.55
9	2.55	1.7	1.55	2.0	1.9	1.9	1.5	1.8	1.4	1.4	1.6	1.6
10	2.15	1.7	1.55	1.9	1.9	1.9	1.5	1.8	1.4	1.4	1.55	1.75
11	2.05	1.7	1.5	1.9	1.9	1.9	1.5	1.8	1.4	1.4	1.5	1.9
12	1.95	1.7	1.5	1.9	1.95	1.85	1.5	1.8	1.4	1.4	1.5	1.7
13	1.95	1.7	1.5	1.8	1.95	1.9	1.55	1.8	1.4	1.4	1.5	1.6
14	1.9	1.7	1.5	1.8	1.95	1.85	1.55	1.8	1.4	1.4	1.5	1.6
15	1.9	1.7	1.5	1.8	1.95	1.85	1.55	1.8	1.4	1.8	1.5	1.6
16	1.9	1.7	1.5	1.85	2.0	1.85	1.55	1.75	1.4	1.5	1.6	1.6
17	1.85	1.65	1.5	1.85	2.05	1.85	1.55	1.7	1.4	1.4	1.6	1.6
18	1.85	1.65	1.5	1.8	2.0	1.85	1.55	1.7	1.4	1.4	1.55	1.6
19	1.85	1.65	1.55	1.9	2.0	1.9	1.55	1.7	1.4	1.4	1.5	1.9
20	1.8	1.65	1.6	1.9	2.0	1.95	1.55	1.7	1.4	1.4	1.5	1.9

[a] River did not freeze near gage during 1905.

Daily gage height, in feet, of Phillips Lake, north outlet, at East Holden, 1904–1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
21	1.8	1.65	1.55	1.85	2.0	1.95	1.55	......	1.4	1.4	1.5	1.9
22	1.8	1.6	1.6	2.0	2.0	1.95	1.55	......	1.4	1.8	1.5	2.3
23	1.8	1.6	1.6	2.0	2.0	1.9	1.55	1.9	1.4	1.5	1.5	1.9
24	1.8	1.6	1.6	2.0	2.0	1.9	1.55	1.9	1.4	1.5	1.5	2.0
25	1.8	1.6	1.7	2.0	1.95	1.9	1.55	1.9	1.4	1.5	1.4	2.4
26	1.8	1.6	1.9	1.95	1.95	1.85	1.55	1.9	1.4	1.5	1.4	2.0
27	1.8	1.6	1.95	1.9	1.9	1.9	1.55	1.85	1.4	1.5	1.4	1.9
28	1.8	1.6	2.0	1.9	1.9	1.85	1.55	1.85	1.4	1.5	1.4	1.9
29	1.8	......	2.1	1.9	1.9	1.85	1.55	1.85	1.4	1.5	1.45	1.9
30	1.8	......	2.1	1.9	1.9	1.85	1.55	1.8	1.4	1.5	1.5	1.8
31	1.75	......	2.3	......	1.9	......	1.6	1.8	......	1.5	......	1.8
1906.[a]												
1	1.8	2.3	2.4	2.4	2.5	2.5	1.8	1.65	1.8	1.55	1.9	1.7
2	2.0	2.3	2.45	2.45	2.2	2.35	2.45	1.65	1.8	1.55	2.1	1.7
3	2.3	2.5	2.4	2.4	2.5	2.0	1.8	1.65	1.8	1.55	2.3	1.8
4	1.85	2.2	2.5	2.15	2.2	2.45	2.3	1.65	1.8	1.55	2.3	1.8
5	1.85	2.2	2.35	1.8	2.2	2.4	2.3	1.65	1.8	1.55	2.3	1.8
6	1.85	2.2	2.3	2.45	2.2	2.5	2.35	1.65	1.75	1.55	2.3	1.8
7	2.0	2.1	2.05	2.5	2.5	2.55	2.2	1.65	1.7	1.55	2.8	1.8
8	2.2	2.05	2.05	1.8	2.3	2.3	1.8	1.65	1.7	1.55	2.4	1.7
9	1.85	2.05	2.3	2.3	2.25	2.0	1.7	1.65	1.65	1.55	2.4	1.7
10	2.6	2.05	2.4	2.35	2.5	2.0	1.7	1.65	1.6	1.55	2.4	1.7
11	2.0	2.0	2.5	2.3	2.4	2.4	1.8	1.7	1.6	1.55	1.9	1.7
12	1.9	2.0	2.45	2.3	2.2	2.3	1.7	1.65	1.6	1.55	2.4	1.7
13	1.8	2.05	2.4	2.4	2.2	2.4	1.7	1.65	1.6	1.55	2.4	1.7
14	1.8	2.5	2.5	2.3	2.25	2.25	1.7	1.65	1.6	1.55	2.4	1.7
15	1.8	2.5	2.45	2.15	2.45	2.4	1.7	1.65	1.6	1.6	2.4	1.7
16	2.2	2.2	2.3	2.55	2.3	2.4	1.7	1.65	1.6	1.55	2.25	1.7
17	2.3	2.5	2.3	2.32	2.05	2.0	1.7	1.65	1.6	1.55	2.4	1.7
18	2.1	2.3	2.3	2.38	2.05	2.3	1.7	1.7	1.6	1.55	1.9	1.7
19	2.1	2.35	2.3	2.38	2.05	2.4	1.7	1.9	1.6	1.55	2.5	1.7
20	2.1	2.5	2.25	2.42	2.0	2.35	1.7	1.9	1.6	1.55	2.5	1.7
21	2.1	2.2	2.1	2.42	2.0	2.4	1.7	1.9	1.6	1.55	2.4	1.75
22	2.1	2.5	2.5	2.2	2.05	2.4	1.7	1.9	1.55	1.55	2.4	1.75
23	2.1	2.35	2.3	2.4	2.25	2.45	1.7	1.9	1.55	1.5	2.4	1.75
24	2.55	2.4	2.2	2.15	2.4	1.9	1.7	1.9	1.55	1.45	2.4	1.8
25	2.4	2.2	2.2	2.4	2.5	2.3	1.65	1.9	1.55	1.5	1.9	1.8
26	2.4	2.3	2.3	2.5	2.4	2.4	1.65	1.9	1.55	1.95	1.7	1.8
27	2.5	2.5	2.3	2.3	2.0	2.3	1.65	1.85	1.55	1.95	1.7	1.8
28	2.4	2.5	2.5	2.2	2.05	2.4	1.65	1.85	1.55	1.6	1.7	1.8
29	2.4	......	2.5	2.2	2.3	2.55	1.65	1.8	1.55	1.75	1.7	1.8
30	2.4	......	2.5	2.4	2.3	2.15	1.65	1.8	1.55	1.6	1.7	1.8
31	2.4	......	2.55	......	2.4	......	1.65	1.8	......	1.9	......	1.8
1907.												
1	1.9	1.9	4.9	2.5	1.7	1.8	1.95	2.1	1.8	2.25	1.7	2.2
2	1.9	1.9	3.8	2.1	2.6	2.0	2.5	2.1	1.75	1.9	1.7	2.2
3	1.9	1.9	2.0	1.8	2.0	2.5	2.05	2.1	1.7	1.85	2.1	2.2
4	1.9	1.9	2.0	1.8	2.5	2.5	2.0	2.05	1.7	1.8	1.95	2.2
5	1.9	1.9	2.4	2.5	2.0	2.4	1.9	2.05	1.75	1.8	1.9	2.2
6	1.9	1.9	2.4	2.5	2.55	2.0	1.9	2.05	1.75	1.8	1.9	2.15
7	1.9	1.9	2.2	1.7	2.55	2.0	1.8	2.05	1.8	2.2	2.4	2.1
8	1.9	2.0	2.2	2.4	2.5	2.0	1.8	2.05	2.0	2.1	2.2	2.0
9	1.9	2.0	2.2	2.4	2.2	1.8	1.9	2.05	1.95	2.05	2.2	1.95
10	1.9	2.9	2.1	2.5	2.0	2.4	1.95	2.05	1.8	2.0	2.1	1.95
11	2.5	3.5	2.1	2.55	2.1	2.0	1.95	2.05	1.8	1.9	2.1	2.55
12	2.2	3.0	2.05	2.3	2.45	2.0	2.5	2.05	1.9	1.8	2.1	2.4
13	2.1	3.0	2.0	2.3	2.45	2.4	2.55	2.05	1.9	1.8	2.2	2.3
14	1.85	2.5	2.0	2.0	2.5	2.5	1.8	1.9	1.9	1.8	2.2	2.2
15	1.9	2.45	2.0	2.3	2.45	2.5	1.8	1.85	1.9	1.8	2.2	2.2
16	1.85	2.2	2.0	2.3	2.4	1.9	1.8	1.8	1.9	1.8	2.2	2.2
17	2.0	2.2	1.9	2.7	2.45	2.55	1.8	1.75	1.9	1.8	2.2	2.55
18	2.0	2.2	2.0	2.7	2.45	2.5	1.8	1.75	1.9	1.9	2.2	2.2
19	1.9	2.2	2.2	2.65	2.15	2.4	1.8	1.75	1.9	1.9	2.4	2.2
20	1.95	2.15	2.2	2.65	1.8	1.9	1.8	1.7	1.9	1.9	2.4	1.95

[a] The outlet does not freeze over near the gage, but during short periods the gage height may be affected by ice conditions downstream.

Daily gage height, in feet, of Phillips Lake, north outlet, at East Holden, 1904-1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
21	1.95	2.15	2.2	2.0	2.5	2.6	1.8	1.7	1.9	1.9	1.9	1.95
22	1.9	2.1	2.0	2.6	2.45	2.4	1.9	1.7	1.9	1.9	2.6	2.1
23	1.95	2.1	2.0	2.6	2.5	1.8	2.6	1.7	1.95	1.9	2.4	2.1
24	1.9	2.1	1.9	2.6	2.45	2.0	2.6	1.7	2.0	1.9	2.1	2.7
25	1.9	2.1	1.9	2.6	2.4	2.0	2.6	1.7	2.2	1.9	2.3	1.95
26	1.9	2.1	2.2	2.2	1.8	2.0	2.6	1.8	2.15	1.85	2.3	1.9
27	1.9	2.1	2.2	2.2	2.4	2.0	2.6	1.8	2.15	1.8	2.3	2.2
28	1.9	2.0	2.5	2.3	2.3	2.35	2.1	1.8	2.15	1.8	2.3	2.2
29	1.9		2.5	2.7	2.3	2.3	2.6	1.8	2.2	1.8	2.25	2.2
30	1.9		2.5	2.0	2.6	1.95	2.6	1.8	2.25	1.7	2.2	2.1
31	1.9		2.2		2.0		2.1	1.8		1.7		2.2

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1908.							1908.						
1	2.2	2.3	2.1	2.75	2.9	2.35	16	2.1	2.25	2.3	2.8	2.8	2.7
2	2.1	2.3	2.1	2.55	2.4	2.75	17	2.05	2.45	2.3	2.1	2.45	2.3
3	2.05	2.3	2.05	2.55	2.5	2.7	18	2.05	2.15	2.1	2.1	2.1	2.75
4	2.05	2.2	2.0	2.3	2.8	2.7	19	2.05	2.15	2.1	2.1	2.65	2.75
5	2.05	2.0	2.0	2.3	2.75	2.7	20	2.05	2.3	2.1	2.8	2.7	1.95
6	2.1	2.2	2.0	2.75	2.8	2.6	21	2.0	2.3	2.05	2.4	2.5	2.3
7	2.15	2.0	2.0	2.2	2.9	2.3	22	2.0	2.1	2.05	2.8	2.7	1.9
8	2.75	2.0	2.0	2.7	2.8	2.5	23	2.0	2.1	2.05	2.9	2.3	2.0
9	2.15	2.1	2.0	2.05	2.85	2.3	24	2.0	2.1	2.9	2.7	2.7	2.0
10	2.1	2.15	2.0	2.7	2.5	2.75	25	2.0	2.1	2.5	2.7	2.75	1.95
11	2.1	2.0	2.0	2.7	2.8	2.1	26	2.0	2.1	2.7	2.4	2.7	1.9
12	2.1	2.0	2.0	2.4	2.8	2.3	27	2.0	2.2	2.8	2.8	2.15	1.9
13	2.15	2.0	2.0	2.9	2.8	2.7	28	2.05	2.15	2.3	2.3	2.0	1.9
14	2.1	2.0	2.05	2.35	2.8	1.95	29	2.05	2.1	2.7	2.75	1.95	2.75
15	2.1	2.0	2.05	2.7	2.45	2.9	30	2.05		2.6	2.9	2.1	2.75
							31	2.2				2.15	

Daily gage height, in feet, of Phillips Lake, at East Holden, 1904-1908.

Day.	July.	Aug.	Oct.	Dec.	Day.	July.	Aug.	Oct.	Dec.
1904.					1904.				
6		6.50		8.30	19	7.05			
14		6.37			21		6.62		
17			7.34		22		6.70		
18		6.40			31	6.70			

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.[a]												
1				9.5			8.1					
2									6.4			6.5
3						8.7						
4		8.8	8.3								6.0	
5								7.6				
6					8.9							
7										6.3		
8				9.7			8.0					
9									6.4			7.4
10						8.6						
11		8.8	8.3								6.2	
12								7.4				
13					8.8							
14										6.2		
15				9.6			7.9	7.2				
16									6.4			7.6
17				9.4		8.5						
18		8.3	8.2								6.3	
19								7.1				
20					9.1							

[a] Feb. 4, 11, gage height to top of ice; ice 4 inches thick. Feb. 18, 25, and Mar. 4, no ice at gauge. Apr. 22, ice left lake. Dec. 16, 2 inches ice at gage. Dec. 23, 30, no ice at gage.

Daily gage height, in feet, of Phillips Lake, north outlet, at East Holden, 1904–1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
21										6.1		
22				9.3			7.7					
23									6.4			7.6
24						8.2						
25		8.4	8.5		9.0						6.3	
26								6.7				
27					8.9							
28										6.0		
29				9.0			7.6					
30									6.3			7.6
31												
1906.[a]												
1									5.8			5.9
2						9.3						
3		8.7	7.1								5.35	
4								6.7				
5					9.4							
6	7.8									5.35		
7				6.8			7.2					
8									5.7			6.1
9						9.1						
10		8.4	7.4								5.3	
11								6.6				
12					9.4							
13	7.9									5.35		
14				7.3			7.1					
15									5.5			6.1
16						8.6						
17		8.1	6.8								5.35	
18								6.4				
19					9.1							
20	8.3									5.3		
21				9.2			6.9					
22									5.4			6.4
23		7.6			8.8	8.1						
24		7.5	6.4								5.7	
25								6.2				
26					8.7							
27	8.8									4.1		
28				9.4			6.9					
29									5.35			6.8
30						7.6						
31			6.4									
1907.[b]												
1						8.4						
2		7.9	7.2								6.0	
3								6.8				
4					9.6							
5	7.2									5.9		
6				7.2			7.9					
7									6.1			8.6
8						8.5						
9		7.9	6.8								8.1	
10								6.5				
11					9.0							
12	7.5									6.2		
13				7.7			7.6					
14									6.0			9.0
15						8.4						
16		7.6	6.5								8.4	
17								6.3				
18					8.8							
19	7.6									6.1		
20				8.3			7.4					

[a] The lake did not freeze over at the gage during 1906.

[b] The lake did not freeze over at the gage during 1907. Ice left the lake Apr. 30, 1907. Lake frozen over Dec. 21, 1907.

Daily gage height, in feet, of Phillips Lake, north outlet, at East Holden, 1904–1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
21									5.9			9.0
22						8.3						
23		7.5	6.3								8.4	
24								6.2				
25					8.5							
26	7.8									6.0		
27				9.6			7.1					
28									5.7			9.0
29						8.0						
30			6.3								8.6	
31								6.1				

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1908.[a]							1908.[a]						
1		8.9					16					8.8	
2					8.7		17						
3							18	9.2			8.8		
4	9.1			9.1			19						
5							20						8.1
6						8.7	21			9.0			
7			9.0				22		9.1				
8		8.9					23					8.5	
9					9.0		24						
10							25	8.9			8.7		
11	9.2			8.9			26						
12							27						8.0
13						8.3	28			9.0			
14			8.8				29		9.1				
15		9.0					30					8.4	
							31						

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[a] The lake did not freeze over at the gage during 1908. Ice went out of lake, except from coves, Apr. 22, 1908.

Rating table for Phillips Lake, north outlet, at East Holden, 1904–1908.

Gage height	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
1.40	1.3	2.20	36.5
1.50	3.6	2.30	42
1.60	7.2	2.40	47.5
1.70	11.3	2.50	53
1.80	15.8	2.60	59
1.90	20.5	2.70	65
2.00	25.5	2.80	71
2.10	31	2.90	77

NOTE.—The above table is not applicable for ice or obstructed-channel conditions. It is based on 10 discharge measurements made during 1904–1906 and is fairly well defined. Discharges for gage heights 3 feet and over, estimated.

Rating table for Phillips Lake, southeast outlet, near Lake House railroad station, 1904–1908.

Gage height.	Discharge.	Gage height.	Discharge.	Gage height.	Discharge.
Feet.	*Sec.-ft.*	*Feet.*	*Sec.-ft.*	*Feet.*	*Sec.-ft.*
5.90	0.01	7.10	0.95	8.30	3.2
6.00	.02	7.20	1.10	8.40	3.6
6.10	.03	7.30	1.25	8.50	4.2
6.20	.04	7.40	1.40	8.60	5.3
6.30	.05	7.50	1.55	8.70	7.0
6.40	.07	7.60	1.70	8.80	9.5
6.50	.10	7.70	1.85	8.90	13
6.60	.20	7.80	2.0	9.00	17
6.70	.35	7.90	2.2	9.20	29
6.80	.50	8.00	2.4	9.40	46
6.90	.65	8.10	2.6	9.60	65
7.00	.80	8.20	2.9		

NOTE.—The above table is not applicable for ice or obstructed channel conditions. It is based on 18 discharge measurements made during 1904–1908 and is fairly well defined. It applies to Phillips Lake gage heights.

Daily discharge, in second-feet, of Phillips Lake, north outlet, at East Holden, 1904–1908.

Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Day.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1904.							1904.						
1	......	11.3	2.4	(a)	2.4	15.8	16	3.6	1.3	1.3	......	2.4	9.2
2	......	11.3	3.6	......	2.4	20.5	17	3.6	1.3	1.3	2.4	2.4	9.2
3	......	9.2	3.1	......	2.4	25.5	18	3.6	1.3	1.3	2.4	2.4	9.2
4	......	9.2	2.4	......	2.4	15.8	19	4.3	1.3	1.3	2.4	2.4	11.3
5	......	9.2	2.4	......	2.4	11.3	20	5.4	1.3	1.3	2.4	2.4	9.2
6	......	7.2	2.4	......	2.4	11.3	21	4.3	8.0	1.3	2.4	3.6	11.3
7	7.2	7.2	2.4	......	2.4	11.3	22	3.6	3.6	1.3	2.4	3.6	13.5
8	7.2	7.2	2.4	......	2.4	11.3	23	3.6	3.1	1.3	2.4	3.6	11.3
9	7.2	7.2	2.4	......	2.4	11.3	24	3.6	2.4	1.3	2.4	5.4	7.2
10	7.2	5.4	1.8	......	2.4	9.2	25	3.6	2.4	1.3	2.4	7.2	9.2
11	7.2	5.4	1.3	......	2.4	9.2	26	3.6	2.4	1.3	2.4	9.2	9.2
12	7.2	5.4	1.3	......	2.4	9.2	27	5.4	2.4	1.3	2.4	11.3	9.2
13	7.2	3.1	1.3	......	2.4	11.3	28	11.3	2.4	1.3	2.4	13.5	11.3
14	5.4	2.4	1.3	......	2.4	11.3	29	11.3	3.1	1.3	2.4	13.5	9.2
15	3.6	1.3	1.3	......	2.4	9.2	30	11.3	2.4	1.3	2.4	13.5	9.2
							31	11.3	2.4	......	2.4	......	9.2

[a] No record Oct. 1 to 16. Daily discharge estimated at 1.8 second-feet.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
1	7.2	13.6	7.2	28.2	20.5	20.5	18.2	5.4	15.8	1.3	11.3	3.6
2	7.2	13.6	7.2	15.8	20.5	20.5	20.5	5.4	15.8	1.3	3.6	3.6
3	7.2	13.6	7.2	15.8	18.2	20.5	20.5	5.4	15.8	1.3	3.6	11.3
4	7.2	13.6	7.2	18.2	23.0	20.5	20.5	5.4	15.8	1.3	3.6	11.3
5	11.3	13.6	7.2	20.5	20.5	20.5	11.3	5.4	15.8	1.3	3.6	5.4
6	11.3	11.3	7.2	36.5	23.0	25.5	11.3	5.4	7.2	1.3	3.6	5.4
7	11.3	11.3	7.2	36.5	20.5	20.5	3.6	15.8	3.6	1.3	3.6	5.4
8	65.0	11.3	5.4	31.0	20.5	20.5	3.6	18.2	2.4	1.3	5.4	5.4
9	56.0	11.3	5.4	25.5	20.5	20.5	3.6	15.8	1.3	1.3	7.2	7.2
10	33.8	11.3	5.4	20.5	20.5	20.5	3.6	15.8	1.3	1.3	5.4	13.6
11	28.2	11.3	3.6	20.5	20.5	20.5	3.6	15.8	1.3	1.3	3.6	20.5
12	23.0	11.3	3.6	20.5	23.0	18.2	3.6	15.8	1.3	1.3	3.6	11.3
13	23.0	11.3	3.6	15.8	23.0	20.5	5.4	15.8	1.3	1.3	3.6	7.2
14	20.5	11.3	3.6	15.8	23.0	18.2	5.4	15.8	1.3	1.3	3.6	7.2
15	20.5	11.3	3.6	15.8	23.0	18.2	5.4	15.8	1.3	15.8	3.6	7.2
16	20.5	11.3	3.6	18.2	25.5	18.2	5.4	13.6	1.3	3.6	7.2	7.2
17	18.1	9.2	3.6	18.2	28.2	18.2	5.4	11.3	1.3	1.3	7.2	7.2
18	18.1	9.2	3.6	15.8	25.5	18.2	5.4	11.3	1.3	1.3	5.4	7.2
19	18.1	9.2	5.4	20.5	25.5	18.2	5.4	11.3	1.3	1.3	3.6	20.5
20	15.8	9.2	7.2	20.5	25.5	20.5	5.4	11.3	1.3	1.3	3.6	20.5

Daily discharge, in second-feet, of Phillips Lake, north outlet, at East Holden, 1904–1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1905.												
21	15.8	9.2	5.4	18.2	25.5	23.0	5.4	[a] 15.9	1.3	1.3	3.6	20.5
22	15.8	7.2	7.2	25.5	25.5	23.0	5.4	[a] 15.9	1.3	15.8	3.6	42.0
23	15.8	7.2	7.2	25.5	25.5	23.0	5.4	20.5	1.3	3.6	3.6	20.5
24	15.8	7.2	7.2	25.5	25.5	20.5	5.4	20.5	1.3	3.6	3.6	25.5
25	15.8	7.2	11.3	25.5	23.0	20.5	5.4	20.5	1.3	3.6	1.3	47.5
26	15.8	7.2	20.5	23.0	23.0	18.2	5.4	20.5	1.3	3.6	1.3	25.5
27	15.8	7.2	23.0	20.5	20.5	20.5	5.4	18.2	1.3	3.6	1.3	20.5
28	15.8	7.2	25.5	20.5	20.5	18.2	5.4	18.2	1.3	3.6	1.3	20.5
29	15.8	....	31.0	20.5	20.5	18.2	5.4	18.2	1.3	3.6	2.4	20.5
30	15.8	....	31.0	20.5	20.5	18.2	5.4	15.8	1.3	3.6	3.6	15.8
31	13.6	....	42.0	....	20.5	....	7.2	15.8	....	3.6	....	15.8
1906.												
1	15.8	42	47.5	47.5	53	53	15.8	9.2	15.8	5.4	20.5	11.3
2	25.5	42	5.02	50.2	36.5	44.8	50.2	9.2	15.8	5.4	31	11.3
3	42	53	47.5	47.5	53	25.5	25.5	9.2	15.8	5.4	42	15.8
4	18.2	36.5	53	33.8	36.5	50.2	42	9.2	15.8	5.4	42	15.8
5	18.2	36.5	44.8	15.8	36.5	47.5	42	9.2	15.8	5.4	42	15.8
6	18.2	36.5	42	50.2	36.5	53	44.8	9.2	13.6	5.4	42	15.8
7	25.5	31	28.2	53	53	56	36.5	9.2	11.3	5.4	42	15.8
8	36.5	28.2	28.2	15.8	42	42	15.8	9.2	11.3	5.4	47.5	11.3
9	18.2	28.2	42	42	39.2	25.5	11.3	9.2	9.2	5.4	47.5	11.3
10	59	28.2	47.5	44.8	53	25.5	11.3	9.2	7.2	5.4	47.5	11.3
11	25.5	25.5	53	42	47.5	47.5	15.8	11.3	7.2	5.4	20.5	11.3
12	20.5	25.5	50.2	42	36.5	42	11.3	9.2	7.2	5.4	47.5	11.3
13	15.8	28.2	47.5	47.5	36.5	47.5	11.3	9.2	7.2	5.4	47.5	11.3
14	15.8	53	53	42	39.2	39.2	11.3	9.2	7.2	5.4	47.5	11.3
15	15.8	53	50.2	33.8	50.2	47.5	11.3	9.2	7.2	7.2	47.5	11.3
16	36.5	36.5	42	56	42	47.5	11.3	9.2	7.2	5.4	39.2	11.3
17	42	53	42	43.1	28.2	25.5	11.3	9.2	7.2	5.4	47.5	11.3
18	31	42	42	46.4	28.2	42	11.3	11.3	7.2	5.4	20.5	11.3
19	31	44.8	42	46.4	28.2	47.5	11.3	20.5	7.2	5.4	53	11.3
20	31	53	39.2	48.6	25.5	44.8	11.3	20.5	7.2	5.4	53	11.3
21	31	36.5	31	48.6	25.5	47.5	11.3	20.5	7.2	5.4	47.5	13.6
22	31	53	53	36.5	28.2	47.5	11.3	20.5	5.4	5.4	47.5	13.6
23	31	44.8	42	47.5	39.2	50.2	11.3	20.5	5.4	3.6	47.5	13.6
24	56	47.5	36.5	33.8	47.5	20.5	11.3	20.5	5.4	2.4	47.5	15.8
25	47.5	36.5	36.5	47.5	53	42	9.2	20.5	5.4	3.6	20.5	15.8
26	47.5	42	42	53	47.5	47.5	9.2	20.5	5.4	23	11.3	15.8
27	53	53	42	42	25.5	42	9.2	18.2	5.4	23	11.3	15.8
28	47.5	53	53	36.5	28.2	47.5	9.2	18.2	5.4	7.2	11.3	15.8
29	47.5	....	53	36.5	42	56	9.2	15.8	5.4	13.5	11.3	15.8
30	47.5	....	53	47.5	42	33.8	9.2	15.8	5.4	7.2	11.3	15.8
31	47.5	....	56	....	47.5	....	....	15.8	....	20.5	....	15.8
1907.												
1	20.5	20.5	197	53	11.3	15.8	23	31	15.8	39.2	11.3	36.5
2	20.5	20.5	131	31	59	25.5	53	31	14.1	20.5	11.3	36.5
3	20.5	20.5	25.5	15.8	25.5	53	28.2	31	11.3	18.2	31	36.5
4	20.5	20.5	25.5	15.8	53	53	25.5	28.2	11.3	15.8	23	36.5
5	20.5	20.5	47.5	53	25.5	47.5	20.5	28.2	14.1	15.8	20.5	36.5
6	20.5	20.5	47.5	53	56	25.5	20.5	28.2	14.1	15.8	20.5	33.8
7	20.5	20.5	36.5	11.3	56	25.5	15.8	28.2	15.8	36.5	47.5	31
8	20.5	25.5	36.5	47.5	53	25.5	15.8	28.2	25.5	31	36.5	25.5
9	20.5	25.5	36.5	47.5	36.5	15.8	20.5	28.2	23	28.2	36.5	23
10	20.5	77	31	53	25.5	47.5	23	28.2	15.8	25.5	31	23
11	53	113	31	56	31	25.5	23	28.2	15.8	20.5	31	56
12	36.5	83	28.2	42	50.2	25.5	53	28.2	20.5	15.8	31	47.5
13	31	83	25.5	42	50.2	47.5	56	28.2	20.5	15.8	36.5	42
14	18.2	53	25.5	25.5	53	53	15.8	20.5	20.5	15.8	36.5	36.5
15	20.5	50.2	25.5	42	50.2	53	15.8	18.2	20.5	15.8	36.5	36.5
16	18.2	36.5	25.5	42	47.5	20.5	15.8	15.8	20.5	15.8	36.5	36.5
17	25.5	36.5	20.5	65	50.2	56	15.8	14.1	20.5	15.8	36.5	56
18	25.5	36.5	25.5	65	50.2	53	15.8	14.1	20.5	20.5	36.5	36.5
19	20.5	36.5	36.5	62	33.8	47.5	15.8	14.1	20.5	20.5	47.5	36.5
20	23	33.8	36.5	62	15.8	20.5	15.8	11.3	20.5	20.5	47.5	23

[a] Discharge interpolated.

Daily discharge, in second-feet, of Phillips Lake, north outlet, at East Hadden, 1904–1908—Continued.

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
1907.												
21	23	33.8	36.5	25.5	53	59	15.8	11.3	20.5	20.5	20.5	23
22	20.5	31	25.5	59.	50.2	47.5	20.5	11.3	20.5	20.5	59	31
23	23	31	25.5	59.	53	15.8	59	11.3	23	20.5	47.5	31
24	20.5	31	20.5	59	50.2	25.5	59	11.3	25.5	20.5	31	65
25	20.5	31	20.5	59.	47.5	25.5	59	11.3	36.5	20.5	42	23
26	20.5	31	36.5	36.5	15.8	25.5	59.	15.8	33.8	18.2	42	20.5
27	20.5	31	36.5	36.5	47.5	25.5	59	15.8	33.8	15.8	42	36.5
28	20.5	25.5	53	42	42	44.8	59	15.8	33.8	15.8	42	36.5
29	20.5	....	53	65	42	42	59	15.8	36.5	15.8	39.2	36.5
30	20.5	....	53	25.5	59	23	59	15.8	39.2	11.3	36.5	31
31	20.5	....	36.5	....	25.5	....	31	15.8	....	11.3	....	36.5

Day.	Jan.	Feb.	Mar.	Apr.	May.	June.	Day.	Jan.	Feb.	Mar.	Apr.	May.	June.
1908.							1908.						
1	36.5	42	31	68	77	44.8	16	31	39.2	42	71	71	65
2	31	42	31	56	47.5	68	17	28.2	50.2	42	31	50.2	42
3	28.2	42	28.2	56	53	65	18	28.2	33.8	31	31	31	68
4	28.2	36.5	25.5	42	71	65	19	28.2	33.8	31	31	62	68
5	28.2	25.5	25.5	42	68	65	20	28.2	42	31	71	65	23
6	31	36.5	25.5	68	71	59	21	25.5	42	28.2	47.5	53	42
7	33.8	25.5	25.5	36.5	77	42	22	25.5	31	28.2	71	65	20.5
8	68	25.5	25.5	65	71	53	23	25.5	31	28.2	77	42	25.5
9	33.8	31	25.5	28.2	74	42	24	25.5	31	77	65	65	25.5
10	31	33.8	25.5	65	73	68	25	25.5	31	53	65	68	23
11	31	25.5	25.5	65	71	31	26	25.5	31	65	47.5	65	20.5
12	31	25.5	25.5	47.5	71	42	27	25.5	36.5	71	71	33.8	20.5
13	33.8	25.5	25.5	77	71	65	28	28.2	33.8	42	42	25.5	20.5
14	31	25.5	28.2	44.8	71	23	29	28.2	31	65	68	23	68
15	31	25.5	28.2	65	50.2	77	30	28.2	......	59	77	31	68
							31	36.5	......	[a]64	......	33.8	......

[a] Interpolated.

NOTE.—Daily discharges for Phillips Lake, southeast outlet, can be determined approximately by using the rating table and the weekly lake gage heights.

Monthly discharge of Phillips Lake outlets in Holden and Dedham, 1904–1908.

[Drainage area, 12.3 square miles.]

Month.	Discharge in second-feet.						Run-off (depth in inches on drainage area).
	Northern outlet.			South-eastern outlet.	Total.	Per square mile.	
	Maximum.	Minimum.	Mean.	Mean.			
1904.[a]							
July 7-31	11.3	3.6	6.11	[b]0.61	....	....	....
August	11.3	1.3	4.62	[c].14	....	....	....
September	3.6	1.3	1.71	....	....	....	....
October	2.4	1.8	2.09	([d])	....	....	....
November	13.5	2.4	4.41	....	....	....	....
December	25.5	7.2	11.3	([e])	....	....	....

[a] Values for both stations, 1904–1906, are approximate, owing to local changes in conditions of flow, which could not be covered by meter measurements.

[b] July 19–31.

[c] August 1–22.

[d] Discharge Oct. 17, 1.31 second-feet.

[e] Discharge Dec. 6, 3.2 second-feet.

Monthly discharge of Phillips Lake outlets in Holden and Dedham, 1904–1908—Contd.

Month.	Discharge in second-feet.						Run-off (depth in inches on drainage area).
	Northern outlet.			South-eastern outlet.	Total.	Per square mile.	
	Maximum.	Minimum.	Mean.	Mean.			
1905.[a]							
January	65.0	7.2	19.2	....	....	....	....
February	13.6	7.2	10.3	6.44	16.7	1.36	1.42
March	42	8.6	10.3	8.38	18.7	1.52	1.75
April	36.5	15.8	21.8	50.1	71.9	5.85	6.53
May	28.2	18.2	22.6	14.6	37.2	3.02	3.48
June	25.5	18.2	20.2	4.59	24.8	2.02	2.25
July	20.5	3.6	7.36	2.18	9.54	.776	.89
August	20.5	5.4	14.1	1.04	15.1	1.23	1.42
September	15.8	1.3	4.03	.069	4.10	.333	.37
October	15.8	1.3	2.98	.036	3.02	.246	.28
November	11.3	1.3	4.05	.044	4.09	.333	.37
December	42.0	8.6	14.9	1.52	16.4	1.33	1.53
The year	65.0	1.3	12.7	....	....	....	....
1906.[a]							
January	59.0	15.8	33.2	4.22	37.4	3.04	3.50
February	53.0	25.5	40.8	3.70	44.5	3.62	3.77
March	56.0	28.2	44.8	.60	45.4	3.69	4.25
April	56.0	15.8	42.6	19.2	61.8	5.02	5.60
May	53.0	25.5	39.6	30.8	70.4	5.72	6.60
June	56.0	20.5	43.0	13.9	56.9	4.63	5.17
July	50.2	9.2	16.8	.84	17.6	1.43	1.65
August	20.5	9.2	13.5	.15	13.7	1.11	1.28
September	15.8	5.4	8.65	0	8.65	.703	.78
October	23.0	2.4	7.25	0	7.25	.589	.68
November	53.0	11.3	36.5	0	36.5	2.97	3.31
December	15.8	11.3	13.4	.13	13.5	1.10	1.27
The year	59.0	2.4	28.3	6.13	34.5	2.80	37.86
1907.[b]							
January	53	18.2	22.8	1.58	24.4	1.98	2.28
February	113	20.5	38.5	1.83	40.3	3.28	3.42
March	197	20.5	41.7	.34	42.0	3.41	3.93
April	65	11.3	45.0	16.6	61.6	5.01	5.59
May	59	11.3	42.6	22.0	64.6	5.25	6.05
June	59	15.8	35.7	3.45	39.2	3.19	3.56
July	59	15.8	32.2	1.58	33.8	2.75	3.17
August	31	11.3	20.5	.15	20.6	1.67	1.92
September	39.2	11.3	22.1	.02	22.1	1.80	2.01
October	39.2	11.3	19.8	.02	19.8	1.61	1.86
November	59	11.3	34.9	3.0	37.9	3.08	3.44
December	65	20.5	35.4	13.4	48.8	3.97	4.58
The year	1.97	11.3	32.6	5.33	37.9	3.08	41.81
1908.[b]							
January	68	25.5	30.7	22.3	53.0	4.31	4.97
February	50.2	25.5	33.3	17.8	51.1	4.15	4.48
March	77	25.5	37.4	16.1	53.5	4.35	5.02
April	77	28.2	56.4	12.3	68.7	5.59	6.24
May	77	23.0	57.5	8.66	66.2	5.38	6.20
June	77	20.5	47.0	3.77	50.8	4.13	4.61

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[a] Values for both stations, 1904–1906, are approximate, owing to local changes in conditions of flow, which could not be covered by meter measurements.

[b] Values for both stations are classed as D, or approximate, owing to local changes in conditions of flow, which could not be covered by meter measurements.

MISCELLANEOUS MEASUREMENTS IN PENOBSCOT RIVER DRAINAGE BASIN.

In 1884 and in 1886 two discharge measurements were made of Penobscot River near Orono by Prof. George H. Hamlin, of Maine State College, as follows:

September 20, 22, and 23, 1884, a discharge of 3,480 second-feet was obtained by subsurface floats.

September 7 and October 23, 1886, with the river at practically the same stage on both dates, a total discharge of 2,470 second-feet was obtained by use of an Ellis current meter.

These measurements were considered as giving the low-water flow for their respective seasons.

The following miscellaneous discharge measurements were made in Penobscot River drainage basin during 1908:

Miscellaneous discharge measurements in Penobscot River basin in 1908.

Date.	Stream.	Locality.	Width.	Area of section.	Gauge height.	Discharge.
			Feet.	*Sq. ft.*	*Feet.*	*Sec.-ft.*
Apr. 27	Souadabscook Stream	Emersons Mills, Hampden	67	134	[a] 10.13	359
July 10	.....do	.....do	56.5	68.5	[a] 10.99	15.7
10	.....do	.....do	18	9.0	[a] 10.99	14.8
Aug. 11	.....do	.....do	24	34	[b] 6.82	17.5
Sept. 8	.....do	.....do	57	60	[a] 11.14	10.8
8	.....do	.....do	17	6.2	[a] 11.14	6.9

[a] Bench mark is top of floor of highway bridge, 10 feet from left abutment.

[b] Measurement made 100 feet upstream from remains of old highway bridge in Hampden, from timbers across the stream. Bench mark is on top of a log in cribwork on downstream side of left abutment of bridge.

NOTE.—Gage height is distance from bench mark to water surface.

RELATION OF RUN-OFF TO PRECIPITATION.

In the following table the records of precipitation and discharge at Millinocket have been utilized to estimate the ratio of run-off to precipitation by months for the period of 1901–1909, inclusive. The record of discharge at Millinocket has been corrected for storage in the lakes above Millinocket, as explained on page 194, so that it shows approximately the natural flow of the West Branch during the period, and the table gives the ratios based on the observed flow and on the flow as corrected for storage.

Run-off and precipitation in Penobscot River basin above Millinocket, 1901–1909, inclusive, by months.

Month.	Precipitation, in inches.	Run-off, in inches, on drainage area.		Ratio of run-off to precipitation.	
		Observed run-off.	Estimated run-off without storage.	For observed run-off.	For estimated run-off without storage.
1901.					
January	2.53	0.59	0.33	0.23	0.13
February	.59	.90	.47	1.53	.80
March	5.12	.99	.45	.19	.09
April	5.63	5.61	7.31	1.00	1.30
May	.95	4.04	5.02	4.25	5.28
June	3.03	1.57	1.43	.52	.47
July	1.78	2.20	.86	1.24	.48
August	4.59	1.58	1.13	.34	.25
September	1.85	1.54	.42	.83	.23
October	3.68	.83	.26	.23	.07
November	2.55	.39	.38	.15	.15
December	8.75	.71	1.92	.08	.22
The year	41.05	20.95	19.97	.51	.44
1902.					
January	3.97	1.30	1.59	.33	.40
February	.86	1.26	1.20	1.47	1.40
March	6.47	3.30	2.87	.51	.44
April	1.95	7.01	8.67	3.59	4.45
May	2.47	5.80	6.26	2.35	2.54
June	5.82	5.57	5.58	.96	.96
July	2.50	1.48	.53	.59	.21
August	3.63	1.60	.70	.44	.19
September	4.15	1.28	.83	.31	.20
October	5.09	1.41	1.83	.28	.36
November	1.88	1.45	2.20	.77	1.17
December	5.23	1.63	1.41	.31	.27
The year	44.02	33.09	33.67	.75	.76
1903.					
January	2.66	1.00	.58	.38	.22
February	2.82	1.03	.48	.37	.17
March	5.78	3.54	3.16	.61	.55
April	1.62	7.89	10.21	4.87	6.30
May	.64	3.95	5.07	6.17	7.93
June	2.22	1.26	.95	.57	.43
July	3.91	1.49	.54	.38	.14
August	2.66	2.04	.78	.77	.29
September	2.04	1.14	.06	.56	.03
October	2.24	.48	.15	.21	.07
November	2.12	.23	.26	.11	.12
December	3.33	.26	.31	.08	.09
The year	32.04	24.31	22.54	.76	.70
1904.					
January	2.56	.20	.21	.08	.08
February	1.34	.21	.17	.16	.13
March	2.98	.32	.28	.11	.09
April	2.67	.59	1.70	.22	.06
May	3.94	3.12	7.55	.79	1.93
June	2.46	2.19	1.73	.89	.70
July	4.60	1.96	.89	.43	.19
August	4.75	2.09	.68	.44	.14
September	5.95	1.27	1.23	.21	.21
October	2.46	1.36	2.65	.55	1.08
November	1.56	1.36	1.07	.87	.69
December	1.24	1.33	.45	1.07	.36
The year	36.51	16.00	18.61	.44	.51
1905.					
January	4.06	1.37	.43	.34	.11
February	.97	1.21	.19	1.25	.20
March	1.05	1.05	.23	1.00	.22
April	1.38	1.32	3.51	.96	2.54
May	2.66	3.71	5.35	1.39	2.02
June	2.08	1.57	2.32	.77	1.14
July	2.22	1.48	1.00	.67	.45
August	1.50	1.88	.20	1.25	.13
September	2.32	1.36	.06	.59	.03
October	1.13	.90	.06	.80	.05
November	3.72	.26	.17	.07	.05
December	2.90	.25	.17	.09	.06
The year	25.94	16.36	13.69	.63	.53

Run-off and precipitation in Penobscot River basin above Millinocket, 1901–1909, inclusive, by months—Continued.

Month.	Precipitation, in inches.	Run-off, in inches, on drainage area.		Ratio of run-off to precipitation.	
		Observed run-off.	Estimated run-off without storage.	For observed run-off.	For estimated run-off without storage.
1906.					
January	2.76	0.25	0.27	0.09	0.10
February	2.80	.41	.41	.15	.15
March	6.04	.42	.44	.07	.07
April	3.12	.71	1.58	.23	.52
May	3.42	4.23	8.59	1.24	2.52
June	2.78	2.86	2.93	1.03	1.05
July	2.99	2.22	1.00	.74	.34
August	1.80	1.97	.32	1.09	.18
September	2.90	1.20	.16	.41	.06
October	6.62	1.26	.97	.19	.15
November	3.25	1.23	1.07	.38	.33
December	3.40	1.24	.61	.36	.18
The year	41.88	18.00	18.35	.43	.44
1907.					
January	2.65	1.24	.77	.47	.29
February	1.68	.84	.32	.51	.19
March	2.13	.23	.24	.11	.11
April	3.68	.85	1.70	.24	.46
May	2.44	4.34	9.93	1.78	4.07
June	5.30	4.12	3.85	.78	.73
July	5.70	3.19	3.74	.56	.66
August	3.27	2.13	1.84	.66	.56
September	4.34	1.27	.96	.29	.22
October	4.05	1.66	1.76	.41	.44
November	3.56	4.27	4.14	1.17	1.16
December	3.28	2.77	2.20	.84	.67
The year	42.08	26.91	31.45	.64	.75
1908.					
January	2.52	1.91	1.49	.76	.59
February	3.82	1.64	.93	.43	.24
March	2.65	1.83	.93	.69	.35
April	1.93	1.74	2.39	.90	1.24
May	5.16	6.26	9.68	1.21	1.88
June	2.10	4.11	3.80	1.96	1.81
July	2.35	2.33	.87	.99	.37
August	5.01	1.52	.68	.30	.13
September	2.46	1.18	.15	.48	.06
October	3.30	1.22	.19	.37	.06
November	1.88	1.18	.14	.63	.07
December	3.32	1.22	.20	.37	.06
The year	36.50	26.14	21.40	.72	.59
1909.					
January	5.24	.85	.50	.16	.10
February	5.36	.45	.42	.08	.08
March	4.24	.83	.65	.20	.15
April	4.64	1.45	4.90	.31	1.06
May	3.05	5.73	9.34	1.88	3.06
June	2.91	2.74	2.14	.94	.74
July	3.09	2.03	1.41	.66	.46
August	3.07	1.42	.57	.46	.19
September	9.70	1.35	1.15	.14	.12
October	1.80	1.38	2.61	.77	1.45
November	4.92	1.32	1.53	.27	.31
December	2.07	1.34	1.18	.65	.57
The year	50.09	20.89	26.40	.42	.53
The period (1901–1909):					
Total	350.11	202.65	206.08	....	....
Mean	38.90	22.52	22.90	.58	.59
Yearly maximum	50.09	33.09	33.67	.76	.76
Yearly minimum	25.94	16.00	13.69	.42	.4

The subjoined table shows the average monthly precipitation from 1901 to 1909 in the Penobscot River basin above Millinocket; the observed average monthly discharge at Millinocket from 1901 to 1909; the estimated average monthly discharge, as corrected for storage, from 1901 to 1909, and the ratios of these discharges to the precipitation.

The effect of storage on the distribution of the seasonal run-off is clearly shown by a comparison of the third and fourth columns of the table. Under the present conditions (column 3), during April, May, and occasionally in June, water is being stored; during the remainder of the year, except for a short time in the summer, during the log-driving season, stored water is used as required and the regimen of flow is a very even one—in marked contrast to the average conditions of low water existing under natural conditions of flow (column 4) for the fall and winter months.

Mean ratios of run-off to precipitation, West Branch of Penobscot River at Millinocket, 1901–1909.

Month.	Precipitation in inches.	Run-off in inches on drainage area.		Mean ratio of run-off to precipitation, 1901–1909.	
		Observed run-off.	Estimated run-off without storage.	For observed run-off.	For estimated run-off without storage.
January	3.22	0.97	0.69	0.30	0.21
February	2.25	.88	.51	.39	.23
March	4.05	1.39	1.03	.34	.25
April	2.96	3.02	4.66	1.02	1.58
May	2.75	4.57	7.42	1.67	2.70
June	3.18	2.89	2.75	.91	.86
July	3.24	2.04	1.20	.63	.37
August	3.36	1.80	.76	.54	.23
September	3.97	1.29	.56	.32	.14
October	3.37	1.17	1.16	.35	.34
November	2.86	1.30	1.22	.45	.43
December	3.72	1.19	.94	.32	.25
The year	38.90	22.52	22.90	.58	.59

EVAPORATION.

The rate of evaporation from water surfaces varies with the temperature of the water, the velocity of the wind at the water surface, and the dryness of the air, and consequently varies widely in different localities and in the same locality at different seasons. The method adopted for measuring the evaporation from a body of water consists in measuring the loss of water from a pan which is so placed that the contained water has as nearly as possible the same temperature and exposure as that of the water which it is intended to represent.

The rate of evaporation has been measured in Maine by the United States Geological Survey in cooperation with private parties at four places, one of which, Ferguson Pond, Millinocket, is in the Penobscot drainage basin. The records at these stations show approximately the ratio of evaporation from water surface in this State, but the data for the winter months are rather incomplete.

Evaporation stations in Maine

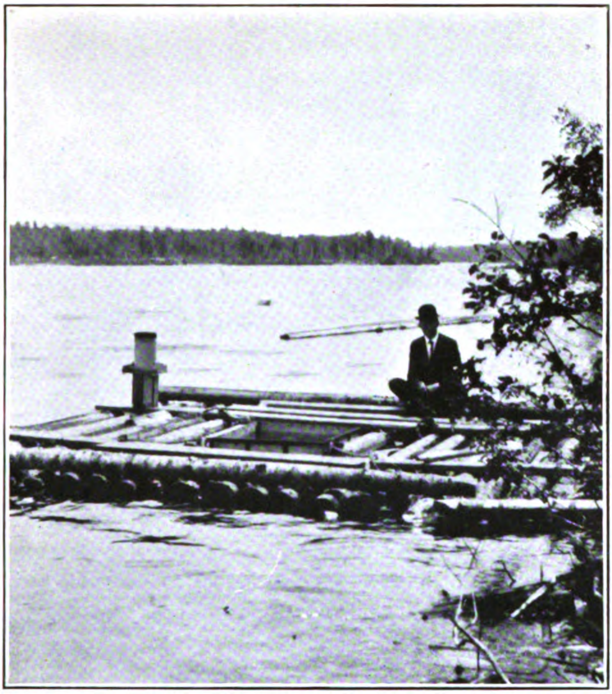
Station.	Location.	Date established.	Date discontinued.
Soldier Pond	Soldier Pond	July 1, 1905	Nov. 7, 1908
Millinocket	Ferguson Pond	do	Oct. 31, 1907
Lewiston	Androscoggin River	do	Do.
Upper Dam	Mooselucmeguntic Lake	Aug. 19, 1905	Oct. 29, 1907

A skeleton log raft about 15 feet square is arranged to float with its surface just out of the water. A clear opening 6 feet square is left in the center and in this opening the evaporation pan floats, its top being kept perhaps 2 or 3 inches above the water surface by means of cylindrical galvanized-iron pontons. The evaporation pan is 3 feet square and 18 inches deep, and is constructed of galvanized iron braced with iron straps. A spindle with sharp point is fixed vertically in the middle of the pan, with its point 1 or 2 inches below the top. The spindle is surrounded by a thin iron cylinder about 3 inches in diameter, with its axis parallel to the spindle, and closed with the exception of some small holes near the bottom. The spindle is originally so set that its point is just submerged by the water and at the time of each subsequent observation the quantity of water required to restore the water surface to the level of the spindle point is measured. For pouring in the water (or dipping it out if rainfall has exceeded the evaporation) the cup used is of such capacity that it represents 0.01 inch depth of water in the pan, so that the number of cupfuls shows the change in depth in hundredths of inches—the evaporation if there has been no rainfall. A rain gage is maintained on the raft so that correction can be made for any rainfall.

The evaporation raft on Soldier Pond is shown in Plate VII. At this station the temperature of the water in the pan and outside of the pan, the precipitation, and the evaporation are recorded. At the other three stations in Maine the temperature of the air, relative humidity, and velocity of the wind are also observed.

In general the results obtained have been very satisfactory. The cylinder surrounding the spindle point prevents the water surface from moving rapidly even when the pan is being considerably shaken by waves. A difference of half a cupful (0.005 inch) can readily be detected.

Some data regarding evaporation from ice were obtained at Millinocket and Lewiston. At Lewiston an iron dish was filled with



A. EVAPORATION STATION AT SOLDIER POND.

Showing raft and floating pan.

B. NICATOUS FALLS, ON PASSADUMKEAG STREAM.

water which was allowed to freeze solid and then exposed. The loss by evaporation was determined by recording the weight of the pan from time to time. During rain and sleet storms observations had to be discontinued and the record was therefore interrupted. Owing to the fact that the evaporation was not measured for the stormy days it seems probable that the estimates made of the monthly evaporation are slightly large. As there is usually some snow during the winter months, serving to protect the lake ice cover, the actual rate of evaporation from the lakes and reservoirs is probably smaller than the figure given. The rate of evaporation from snow is, however, an undetermined quantity.

The following tables show the results in weekly and monthly periods, of the daily determinations of temperature, precipitations, and evaporation.[1]

Evaporation of Soldier Pond at Soldier Pond, 1905–1908.

Period.	Average temperature of water in degrees F.		Total precipitation in inches.	Evaporation in inches.			
	Outside pan.	In pan.		Total.	Average.	Maximum.	Minimum.
1905.							
July 1–8	70.5	72.8	1.02	0.72	0.090	0.15	0.01
July 9–16	70.9	71.9	.17	1.38	.172	.25	.11
July 17–24	67.7	68.0	.72	1.25	.156	.23	.10
July 25–31	69.2	69.6	.69	.95	.136	.28	.05
Mean, 1–31	69.6	70.6	2.60	4.30	.139	.28	.01
Aug. 1–8	70.1	70.2	.46	1.36	.170	.21	.13
Aug. 9–16	70.6	70.1	.78	1.44	.180	.29	.09
Aug. 17–24	66.6	66.8	.10	1.35	.169	.20	.15
Aug. 25–31	64.7	64.9	.03	1.10	.157	.21	.10
Mean, 1–31	68.0	68.0	1.37	5.25	.169	.29	.09
Sept. 1–8	62.0	62.2	1.06	.63	.079	.15	.01
Sept. 9–15	63.0	63.0	.07	.95	.136	.21	.08
Sept. 16–23	61.6	62.0	.73	.48	.060	.13	.01
Sept. 24–30	51.9	52.3	.20	.59	.084	.18	.01
Mean, 1–30	59.6	59.9	2.06	2.65	.088	.21	.01
Oct. 1–8	55.0	55.1	.22	.56	.070	.13	.01
Oct. 9–16	48.4	49.0	.31	.53	.066	.11	.04
Oct. 17–24	44.4	43.8	1.10	[a] .30	[a] .060	.08	.04
Oct. 25–31	37.4	36.6	....	.12	.017	.04	.00
Mean, 1–31	46.3	46.1	1.63	[b] 1.51	.054	.13	.00
Nov. 1–7	35.4	34.7	1.48	.11	.016	.03	.01
Nov. 8–13	35.8	35.0	.29	.05	.008	.03	.00
1906.							
May 3–8	39.3	44.7	.10	.33	.055	.07	.04
May 9–16	39.9	42.2	.85	.35	.044	.12	.00
May 17–24	45.1	49.5	.51	.52	.065	.10	.04
May 25–31	44.1	47.3	.51	.47	.067	.17	.01
Mean, 3–31	[c] 42.1	[c] 45.9	[c] 1.97	[c] 1.67	[c] .058	[c] .17	[c] .00

[a] 5 days. [b] 28 days. [c] 29 days.

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[1] At some of the stations, especially Millinocket, waves during occasional high winds caused the loss of several days' records.

Evaporation of Soldier Pond at Soldier Pond, 1905–1908—Continued.

Period.	Average temperature of water in degrees F.		Total precipitation in inches.	Evaporation in inches.			
	Outside pan.	In pan.		Total.	Average.	Maximum.	Minimum.
1906.							
June 1-8	53.9	57.9	1.30	0.42	0.052	0.08	0.02
June 9-15	57.7	60.9	.34	.77	.110	.18	.04
June 16-23	68.0	70.9	.30	1.10	.138	.18	.06
June 24-30	62.4	63.6	1.01	.59	.084	.17	.02
Mean, 1-30	60.5	63.4	2.95	2.88	.096	.18	.02
July 1-8	65.4	65.8	.17	.97	.121	.15	.04
July 9-16	70.4	71.6	.24	.87	.109	.14	.07
July 17-24	73.6	74.0	.94	1.20	.150	.25	.05
July 25-31	75.2	75.3	.14	1.30	.186	.23	.14
Mean, 1-31	71.2	71.7	1.49	4.34	.140	.25	.04
Aug. 1-8	76.5	77.2	.27	1.60	.200	.27	.13
Aug. 9-16	72.0	72.5	.66	1.52	.190	.25	.09
Aug. 17-24	70.2	70.9	1.06	1.25	.156	.26	.10
Aug. 25-31	66.1	66.4	.24	.97	.139	.22	.09
Mean, 1-31	71.2	71.8	2.23	5.34	.172	.27	.09
Sept. 1-8	60.0	59.9	1.23	.81	.101	.17	.05
Sept. 9-16	58.4	59.0	.46	.85	.106	.21	.04
Sept. 17-24	59.1	59.6	.56	.85	.106	.16	.06
Sept. 25-30	53.7	52.5	.47	.59	.098	.14	.06
Mean, 1-30	57.8	57.8	2.72	3.10	.103	.21	.04
Oct. 1-8	51.5	50.3	.62	.70	.088	.12	.02
Oct. 9-16	48.2	47.5	2.98	.50	.062	.10	.04
Oct. 17-24	49.0	48.5	.64	.44	.055	.09	.03
Oct. 25-31	47.0	45.1	.75	.35	.050	.09	.02
Mean, 1-31	48.9	47.8	4.99	1.99	.064	.12	.02
Nov. 1-8	40.5	38.9	.12	.57	.071	.11	.04
Nov. 9-11	37.0	34.6	.23	.15	.050	.08	.02
1907.							
May 1-8	37.2	39.2	.49	.26	.032	.08	.01
May 9-16	39.6	41.2	.18	.34	.042	.08	.02
May 17-24	41.7	44.9	.47	.39	.049	.08	.02
May 25-31	43.0	44.9	1.11	.41	.059	.11	.00
Mean, 1-31	40.4	42.6	2.25	1.40	.045	.11	.00
June 1-8	48.6	52.0	.98	.40	.050	.08	.02
June 9-15	54.3	59.4	.23	.64	.092	.13	.03
June 16-23	57.8	63.9	1.69	.68	.085	.14	.06
June 24-30	61.4	63.8	1.41	.38	.054	.09	.01
Mean, 1-30	55.5	59.8	4.31	2.10	.070	.14	.01
July 1-8	63.9	67.0	.81	.70	.088	.17	.02
July 9-16	64.0	66.5	.90	.80	.100	.19	.01
July 17-24	67.7	69.2	.55	.64	.080	.11	.03
July 25-31	64.2	64.9	4.47	.18	.026	.05	.00
Mean, 1-31	65.0	66.9	6.73	2.32	.075	.19	.00
Aug. 1-8	65.0	67.3	.53	.69	.086	.14	.02
Aug. 9-16	65.5	66.9	2.18	.80	.100	.20	.00
Aug. 17-24	64.6	66.5	.20	.95	.119	.19	.05
Aug. 25-31	63.0	63.3	.36	.72	.103	.15	.07
Mean, 1-31	64.5	66.0	3.27	3.16	.102	.20	.00
Sept. 1-8	60.2	61.2	.98	.48	.060	.10	.02
Sept. 9-15	59.6	61.0	.73	.49	.070	.14	.02
Sept. 16-23	59.5	61.0	1.42	.67	.084	.16	.04
Sept. 24-30	55.9	56.9	.87	.39	.056	.08	.02
Mean, 1-30	58.8	60.0	4.00	2.03	.068	.16	.02

Evaporation of Soldier Pond at Soldier Pond, 1905–1908—Continued.

Period.	Average temperature of water in degrees F.		Total precipitation in inches.	Evaporation in inches.			
	Outside pan.	In pan.		Total.	Average.	Maximum.	Minimum.
1907.							
Oct. 1–8	50.6	50.7	2.26	0.53	0.066	0.09	0.01
Oct. 9–16	49.0	48.8	.37	.57	.071	.10	.02
Oct. 17–24	47.2	45.8	.01	.67	.084	.10	.06
Oct. 25–31	43.4	42.5	1.82	.29	.041	.10	.00
Mean, 1–31	47.6	47.0	4.46	2.06	.066	.10	.00
Nov. 1–8	40.6	39.9	1.03	.34	.042	.07	.00
Nov. 9–15	40.0	38.7	.25	.13	.019	.04	.00
Mean, 1–15	40.3	39.3	1.28	.47	.031	.07	.00
1908.							
May 12–16	40.2	45.8	.28	.22	.044	.08	.00
May 17–24	43.7	51.1	.09	.41	.051	.06	.03
May 25–31	45.9	48.9	1.80	.23	.033	.05	.02
Mean, 12–31	43.3	48.6	2.17	[a].86	[a].043	.08	.00
June 1–8	49.6	53.6	.15	.53	.066	.11	.02
June 9–15	59.5	64.5	.08	.62	.088	.14	.02
June 16–23	63.5	66.9	2.34	.68	.085	.19	.02
June 24–30	70.1	72.6	.11	.80	.114	.19	.03
Mean, 1–30	60.7	64.4	2.68	2.63	.088	.19	.02
July 1–8	79.0	80.6	1.05	1.00	.125	.18	.07
July 9–16	75.6	77.8	....	1.61	.202	.26	.15
July 17–24	75.0	77.3	.44	1.07	.134	.18	.04
July 25–31	67.2	79.5	.20	1.01	.144	.20	.10
Mean, 1–31	74.2	78.8	1.69	4.69	.151	.26	.04
Aug. 1–8	72.9	74.8	1.52	1.33	.166	.28	.05
Aug. 9–16	74.0	75.9	1.15	1.17	.146	.22	.08
Aug. 17–24	68.0	69.0	1.10	1.08	.135	.18	.08
Aug. 25–31	66.5	68.5	....	1.06	.152	.17	.14
Mean, 1–31	70.4	72.0	3.77	4.64	.150	.28	.05
Sept. 1–8	65.7	67.0	.12	.98	.122	.18	.07
Sept. 9–15	66.9	68.8	....	1.05	.150	.22	.09
Sept. 16–23	64.4	67.0	.12	.84	.105	.16	.07
Sept. 24–30	65.7	68.3	.16	.79	.113	.19	.02
Mean, 1–30	65.7	67.8	.40	3.66	.122	.22	.02
Oct. 1–8	57.8	59.8	1.20	1.06	.132	.16	.09
Oct. 9–16	56.3	57.7	.32	.75	.094	.14	.04
Oct. 17–24	54.1	56.1	....	.83	.104	.17	.07
Oct. 25–31	49.0	50.4	.40	.33	.047	.09	.02
Mean, 1–31	54.3	56.0	1.92	2.97	.096	.17	.02
Nov. 1–7	35.7	36.6	.32	.21	.030	.05	.02

[a] 20 days.

Evaporation of Ferguson Lake at Millinocket, 1905–1907.

Period.	Average temperature of air in degrees F.	Temperature of water, degrees F.		Average relative humidity (per cent).	Average anemometer reading (miles daily).	Total precipitation in inches.	Evaporation in inches.			
		Outside pan.	In pan.				Total.	Average.	Maximum.	Minimum.
1905.										
July 1-8	70.4	70.8	72.0	67.7	140	1.16	1.01	0.126	0.09	0.02
July 9-16	74.5	72.9	73.3	69.6	144	.07	1.50	.188	.37	.04
July 17-24	64.9	72.0	71.5	65.4	114	.44	1.82	.228	.37	.11
July 25-31	64.5	69.9	69.6	69.4	113	1.44	1.22	.175	.25	.10
Mean, 1-31	68.6	71.4	71.6	68.0	128	3.11	5.55	.179	.37	.02
Aug. 1-8	67.9	69.3	69.1	67.8	113	.19	1.27	.159	.28	.08
Aug. 9-16	67.6	70.7	70.6	69.0	115	1.54	1.56	.195	.41	.08
Aug. 17-24	62.7	68.8	68.5	69.8	114	.27	1.59	.199	.26	.10
Aug. 25-31	56.5	66.4	65.9	67.0	101	.03	1.38	.197	.24	.13
Mean, 1-31	63.7	68.8	68.5	68.4	111	2.03	5.80	.187	.41	.08
Sept. 1-8	59.4	64.5	64.0	82.1	80.8	2.40	.70	.088	.24	.00
Sept. 9-15	56.6	64.0	64.1	73.7	122	.36	1.00	.143	.22	.07
Sept. 16-23	58.6	60.8	60.6	82.2	130	.62	.60	.075	.19	.00
Sept. 24-30	46.9	56.0	55.1	72.7	130	.16	1.02	.146	.28	.06
Mean, 1-30	55.4	61.3	61.0	77.7	116	3.54	3.32	.111	.28	.00
Oct. 1-8	52.6	54.9	54.6	66.5	128	.02	.92	.115	.20	.06
Oct. 9-16	47.1	51.9	51.2	70.5	160	.63	.69	.086	.15	.00
Oct. 17-24	42.1	48.0	47.9	68.6	160	.90	.74	.092	.18	.04
Oct. 25-31	32.8	43.0	40.8	64.1	85.0	.00	.59	.084	.16	.05
Mean, 1-31	43.6	49.4	48.6	67.4	133	1.55	2.94	.095	.20	.00
Nov. 1-8	33.5	39.1	38.6	84.8	124	2.12	.30	.038	.11	.00
Nov. 9-15	28.9	37.1	35.6	83.4	139	....	.24	.034	.07	.01
Nov. 20-27	....	....	....	....	....	.08	.355	.044	.12	−.005
Dec. 15-20	....	....	....	....	....	....	.08	.013	.03	.00
Dec. 23-27	....	....	....	....	....	.01	.12	.024	.03	.02
1906.										
Feb. 13-16	....	....	....	....	....	1.00	.11	.028	.07	.00
Feb. 27-Mar. 6	....	....	....	....	....	2.29	.21	.026	.06	.01
Mar. 7-15	....	....	....	....	....	1.83	.29	.032	.06	.01
Mar. 16-25	....	....	....	....	....	2.07	.36	.036	.07	−.04
July 1-8	65.8	65.4	66.4	56.8	100	.34	1.49	.186	.22	.14
July 9-16	69.4	67.3	67.6	76.8	83.7	1.49	.93	.116	.17	.02
July 17-24	70.4	70.9	71.2	78.9	114	1.53	1.15	.144	.27	.04
July 25-31	69.6	71.3	71.3	68.9	95	.33	1.23	.176	.24	.11
Mean, 1-31	68.8	68.7	69.1	70.3	98.2	3.69	4.80	.155	.27	.02
Aug. 1-8	71.8	72.2	72.3	68.0	91.2	.01	1.43	.179	.26	.06
Aug. 9-16	65.6	71.4	70.6	65.8	127	.40	2.10	.262	.41	.12
Aug. 17-24	73.8	70.8	71.3	70.0	93.2	.58	1.19	.149	.22	.04
Aug. 25-31	63.6	69.5	69.0	75.6	121	.91	1.19	.170	.27	.09
Mean, 1-31	68.7	71.0	70.8	69.8	108	1.90	5.91	.191	.41	.04
Sept. 1-8	56.4	62.6	61.9	76.6	146	1.50	1.61	.201	.39	.07
Sept. 9-16	60.9	62.6	61.9	84.5	121	.64	1.23	.154	.32	.05
Sept. 17-24	59.4	62.2	61.2	88.9	88.8	.40	1.11	.139	.22	.03
Sept. 25-30	52.1	58.1	56.8	76.5	....	.54	.55	.092	.15	.02
Mean, 1-30	57.2	61.4	60.4	81.6	....	3.08	4.50	.150	.39	.02
Oct. 1-8	52.2	56.7	55.0	89.3	....	1.00	[a] .47	[a] .094	.14	.05
Oct. 9-16	47.6	51.0	49.4	89.4	105	3.20	[a] .53	[a] .106	.19	.05
Oct. 17-24	45.0	50.4	49.2	86.0	69.8	1.05	.47	.059	.09	.01
Oct. 25-31	42.2	47.9	46.4	86.3	136	1.90	.35	.050	.09	.02
Mean, 1-31	46.7	51.5	50.0	87.8	....	7.15	[b] 1.82	.073	.19	.01

[a] 5 days.

[b] 25 days.

Evaporation of Ferguson Lake at Millinocket, 1905–1907—Continued.

Period.	Average temperature of air in degrees F.	Temperature of water, degrees F.		Average relative humidity (per cent).	Average anemometer reading (miles daily).	Total precipitation in inches.	Evaporation in inches.			
		Outside pan.	In pan.				Total.	Average.	Maximum.	Minimum.
1906.										
Nov. 1–8	36.7	40.5	39.4	71.6	....	1.41	0.61	0.076	0.13	0.00
Nov. 9–16	32.2	36.7	35.8	83.3	....	1.59	.31	.039	.08	.02
Nov. 17–24	35.8	35.2	34.5	74.4	152	.23	[a] .10	[a] .025	.04	.02
Nov. 25–30	24.5	33.1	32.1	79.6	153	....	....	....	....	....
1907.										
May 1–8	43.8	40.0	40.2	74.3	133	.58	[b] .31	[b] .062	.08	.05
May 9–16	49.8	42.2	42.6	68.0	161	.04	[c] .57	[c] .081	.12	.05
May 17–24	53.2	48.5	49.1	70.8	174	.73	[d] .51	[d] .085	.13	.04
May 25–31	49.6	47.9	48.5	78.1	144	1.01	.76	.109	.20	.04
Mean, 1–31	49.1	44.6	45.1	72.8	153	2.36	[e] 2.15	[e] .086	.20	.04
June 1–8	56.0	50.9	51.5	76.5	79.8	.45	.63	.079	.11	.05
June 9–15	58.9	54.0	54.3	80.0	110	.37	.77	.110	.20	.01
June 16–23	69.0	60.0	60.6	87.4	76	.02	.84	.105	.14	.05
June 24–30	68.8	64.3	64.9	85.5	33.6	4.76	.61	.087	.17	.00
Mean, 1–30	63.2	57.3	57.8	82.4	74.8	5.60	2.85	.095	.20	.00
July 1–8	68.2	64.1	64.5	90.6	28.7	1.16	.85	.106	.19	.04
July 9–16	68.8	65.3	65.5	89.7	67.1	1.09	1.19	.149	.23	.06
July 17–24	74.0	68.5	69.1	84.8	117	.95	1.28	.160	.25	.08
July 25–31	64.8	65.4	65.9	93.8	102	1.47	.62	.089	.15	.04
Mean, 1–31	69.0	65.8	66.2	89.7	78.7	4.67	3.94	.127	.25	.04
Aug. 1–8	67.4	66.8	66.9	95.0	89.1	2.91	.85	.106	.23	.04
Aug. 9–16	70.5	67.8	68.3	89.9	143	.15	1.69	.211	.27	.15
Aug. 17–24	65.5	66.2	65.6	90.5	126	.22	1.46	.182	.28	.11
Aug. 25–31	61.0	63.5	63.0	95.7	171	.76	1.39	.199	.27	.10
Mean, 1–31	66.1	66.1	66.0	92.8	132	4.04	5.39	.174	.28	.04
Sept. 1–8	60.9	61.8	61.4	91.0	80.5	2.58	.94	.118	.15	.06
Sept. 9–15	60.2	62.8	62.0	71.2	106	.59	.74	.106	.21	.00
Sept. 16–23	58.5	61.1	60.5	81.7	90	.05	1.16	.145	.27	.10
Sept. 24–30	52.6	57.2	55.2	72.6	116	1.94	.88	.126	.23	.04
Mean, 1–30	58.0	60.7	59.8	79.1	98.1	5.16	3.72	.124	.27	.00
Oct. 1–8	49.2	53.0	51.6	82.7	122	.93	.90	.112	.30	.02
Oct. 9–16	46.1	49.8	48.2	78.6	78.6	1.37	.76	.095	.15	.02
Oct. 17–24	41.1	46.3	44.3	62.0	136	....	.90	.112	.18	.05
Oct. 25–31	39.4	41.6	40.5	73.5	136	1.74	.42	.060	.08	.02
Mean, 1–31	44.0	47.7	46.2	74.2	118	4.04	2.98	.096	.30	.02

[a] 4 days. [b] 5 days. [c] 7 days. [d] 6 days. [e] 25 days.

Evaporation of Androscoggin River at Lewiston, 1905–1907.

Period.	Average temperature of air in degrees F.	Average temperature of water, degrees F.		Average relative humidity (per cent).	Average anemometer reading (miles daily).	Total precipitation in inches.	Evaporation in inches.			
		Outside pan.	In pan.				Total.	Average.	Maximum.	Minimum.
1905.										
July 1–8	66.5	69.9	70.4	....	66.8	0.64	0.96	0.120	0.21	0.01
July 9–16	72.2	78.1	78.1	67.8	62.6	.11	1.88	.235	.37	.12
July 17–24	67.5	76.4	76.2	64.9	49.8	.59	2.09	.261	.33	.16
July 25–31	63.8	72.0	71.9	68.4	67.0	2.95	1.06	.151	.23	.02
Mean 1–31	67.5	74.1	74.2	67.0	61.6	4.29	5.99	.193	.37	.01
Aug. 1–8	68.4	67.0	67.6	69.9	47.0	.72	.82	.102	.14	.02
Aug. 9–16	70.8	74.6	74.3	71.5	49.2	1.16	1.20	.150	.29	.07
Aug. 17–24	65.2	69.3	69.3	67.0	42.8	....	1.16	.145	.18	.10
Aug. 25–31	63.5	68.9	68.6	65.4	49.7	.19	1.14	.163	.20	.07
Mean 1–31	67.0	70.0	70.0	68.4	47.2	2.07	4.32	.139	.29	.02
Sept. 1–8	62.2	64.4	64.5	79.0	41.9	3.28	.54	.068	.15	.00
Sept. 9–15	61.2	64.1	64.1	71.1	68.7	.94	.94	.134	.31	.05
Sept. 16–23	60.6	60.1	60.0	78.8	39.6	1.26	.52	.065	.13	.00
Sept. 24–30	51.9	57.2	56.9	66.3	87.0	.02	1.02	.146	.28	.05
Mean 1–30	59.0	62.4	61.4	73.8	59.3	5.50	3.02	.101	.31	.00
Oct. 1–8	58.2	57.4	57.6	65.7	74.7	.04	.83	.104	.28	.02
Oct. 9–16	52.6	54.2	54.1	62.7	87.6	.75	.76	.095	.16	.01
Oct. 17–24	48.6	50.3	50.2	61.6	75.0	.23	.56	.070	.14	−.01
Oct. 25–31	38.6	43.3	43.0	54.4	58.4	T.	.39	.056	.09	.02
Mean 1–31	49.5	51.3	51.2	61.1	73.9	1.02	2.54	.082	.28	−.01
Nov. 1–8	38.0	38.7	38.4	78.6	83.4	2.41	.25	.031	.12	.00
Nov. 9–15	33.4	35.4	34.9	69.0	80.9	.10	[a] .13	[a] .021	.04	.00
Nov. 16–18	34.8	33.4	33.4	69.9	122	.49	.02	....	....	....
Nov. 19–24	34.8	....	....	39.3	66.2	....	.51	.085	.15	.03
Nov. 25–30 [b]	36.9	....	....	59.5	114	.94	[c] .10	....	....	....
Dec. 4–12	27.2	....	....	66.8	88.7	.73	.25	.028	.08	.00
Dec. 13–20	22.2	....	....	61.2	42.8	.05	.12	.015	.03	.01
Dec. 23–27	28.0	....	....	65.2	43.2	.06	.12	.024	.05	.01
Mean 1–31	27.2	....	....	67.3	63.4	3.65	[d] .60	[d] .025	.09	.00
1906.										
Jan. 4–9	24.3	....	....	65.8	78.0	.89	.24	.040	.09	.01
Jan. 12–14	28.8	....	....	77	75	.27	.16	.053	.08	.04
Jan. 17–19	28.3	....	....	38.0	81.3	.24	.16	.053	.11	.02
Jan 24–31	29.7	....	....	59.5	74.9	.34	.23	.029	.07	.00
Mean 1–31	27.3	....	....	67.7	72.1	3.15	[e] .90	.041	.11	.00
Feb. 1–8	20.0	....	....	69.2	97.8	.09	.22	.028	.05	.00
Feb. 9–15	20.1	....	....	75.7	72.6	1.13	.10	.014	.04	−.01
Feb. 16–22	26.2	....	....	67.0	65.3	.12	.30	.043	.11	.01
Feb. 23–28	31.7	....	....	58.7	136	.25	[f] .43	[f] .086	.13	.02
Mean 1–28	24.5	....	....	67.6	92.9	1.59	[g] 1.05	[g] .039	.13	−.01
Mar. 1–8	25.0	....	....	52.3	103	1.31	.36	.045	.09	.01
Mar. 11–17	22.0	....	....	63.7	137	.58	.49	.070	.12	−.02
Mar. 18–23	22.4	....	....	59.0	103	.99	.53	.088	.16	.01
Mar. 24–31	31.1	....	....	54.1	77.6	.45	[f] .49	[f] .098	.18	.01
Mean 1–31	26.1	....	....	58.5	116	4.51	[h] 1.87	[h] .072	.18	−.02

[a] 6 days.

[b] Evaporation from water, Nov. 1–18; evaporation from ice, Nov. 19–30.

[c] 1 day.

[d] 24 days.

[e] 22 days.

[f] 5 days.

[g] 27 days.

[h] 26 days.

Evaporation of Androscoggin River at Lewiston, 1905–1907—Continued.

Period.	Average temperature of air in degrees F.	Average temperature of water, degrees F.		Average relative humidity (per cent).	Average anemometer reading (miles daily).	Total precipitation in inches.	Evaporation in inches.			
		Outside pan.	In pan.				Total.	Average.	Maximum.	Minimum.
1906.										
Apr. 1-8	36.5	....	....	32.4	84.2	0.05	0.87	0.109	0.18	0.04
Apr. 9-15	41.5	....	....	63.6	73.7	2.36	[a] .38	[a] .127	.16	.10
Apr. 16-23	47.9	....	....	46.1	89.0	.03	[b] 1.24	[b] .177	.26	.11
Apr. 24-30	44.7	41.9	43.6	71.9	98.3	.48	.41	.059	.13	.00
Mean 1-30	42.6	....	....	52.5	86.3	2.92	[c] 2.90	[c] .116	.26	.00
May 1-8	50.1	45.9	46.9	68.9	86.0	.28	.28	.035	.08	.00
May 9-16	50.4	47.2	47.9	62.2	87.6	.28	.49	.061	.11	.02
May 17-24	58.7	55.5	56.4	64.6	92.8	.24	.95	.119	.22	.03
May 25-31	52.9	56.3	56.6	73.6	84.9	3.33	.42	.060	.15	.00
Mean 1-31	53.0	51.2	52.0	67.3	87.9	4.13	2.14	.069	.22	.00
June 1-8	62.1	59.3	60.1	74.4	65.2	1.07	.40	.050	.10	.00
June 9-15	64.6	62.2	63.4	56.2	100	.03	1.13	.161	.29	.05
June 16-23	62.6	65.8	66.0	....	71.1	4.46	.86	.108	.19	.06
June 24-30	68.6	67.1	67.7	65.4	56.5	2.11	.47	.067	.12	.01
Mean 1-30	64.3	63.5	64.2	66.2	73.5	7.67	2.86	.095	.29	.00
July 1-8	67.8	70.9	71.4	62.5	....	1.18	1.26	.158	.23	.01
July 9-16	71.6	72.8	73.2	72.3	....	1.29	1.07	.134	.22	.07
July 17-24	74.6	76.7	76.7	73.7	....	2.44	1.32	.165	.25	.07
July 25-31	71.8	75.2	75.4	70.9	68.2	.59	1.14	.163	.24	.05
Mean 1-31	69.2	71.6	71.8	67.7	....	5.50	4.79	.154	.25	.01
Aug. 1-8	73.7	76.4	76.6	72.6	62.0	.07	1.29	.161	.20	.14
Aug. 9-16	69.6	76.5	76.3	60.4	87.0	.30	2.04	.255	.34	.16
Aug. 17-24	72.6	77.2	77.5	70.1	60.0	.29	1.30	.162	.36	.07
Aug. 25-31	68.2	74.3	74.1	69.8	94.0	.15	1.33	.190	.29	.10
Mean 1-31	71.0	76.1	76.1	68.2	75.8	.81	5.96	.192	.36	.07
Sept. 1-8	62.0	66.8	66.4	66.0	99.3	.05	1.58	.198	.39	.10
Sept. 9-16	63.8	67.5	67.5	63.5	85.9	.41	1.11	.139	.25	.04
Sept. 17-24	63.5	67.0	66.8	67.8	75.6	.24	1.14	.142	.33	.05
Sept. 25-30	55.6	61.3	61.4	65.3	87.3	.26	.90	.150	.22	.08
Mean 1-30	61.2	65.6	65.5	65.6	87.0	.96	4.73	.158	.39	.04
Oct. 1-8	54.5	58.2	58.6	66.1	78.1	.54	.92	.115	.16	.03
Oct. 9-16	47.9	52.5	52.2	75.3	81.3	1.85	.64	.080	.13	.00
Oct. 17-24	50.0	51.6	51.4	81.1	53.5	.59	.33	.041	.07	.00
Oct. 25-31	38.4	42.8	42.5	79.9	46.1	1.99	.41	.059	.12	.00
Mean 1-31	47.7	51.3	51.2	75.7	64.8	4.97	2.30	.074	.16	.00
Nov. 1-8	40.4	40.9	40.6	52.6	158	.47	.62	.078	.12	.00
Nov. 9-16	32.8	37.1	36.7	74.9	85.5	2.28	.09	.011	.03	.00
Nov. 17-24	38.0	....	....	61.5	82.2	.19	....	....	....	....
Nov. 25-30	30.6	....	....	87.9	77.3	.44	....	....	....	....
Mean 1-30	35.4	....	....	69.2	101	3.38	....	....	....	....
Dec. 1-8	15.3	....	....	65.8	147	.76	[d] .04	....	....	....
Dec. 9-16	14.0	....	....	74.0	59.3	.96	[e] .08	[e] 013	.03	.00
Dec. 17-24	20.2	....	....	77.6	77.2	.98	[f] .08	[f] .020	.04	.01
Dec. 25-31	25.0	....	....	78.6	67.3	1.20	[g] .08	[g] .027	.04	.00
Mean 1-31	18.6	....	....	74.0	87.7	3.90	[g] .28	[g] .020	....	....
1907.										
Jan. 1-8	30.5	....	....	68.7	68.8	.77	[f] .13	[f] .032	.06	.01
Jan. 9-16	15.0	....	....	70.7	108	.44	[h] .16	[h] .032	.06	.01
Jan. 17-24	9.9	....	....	69.0	100	.92	[h] .08	[h] .016	.04	.00
Jan. 25-31	11.1	....	....	68.7	66.1	.32	.10	.014	.03	.00
Mean 1-31	16.6	....	....	69.3	85.7	2.45	[i] .47	[i] .022	.06	.00

[a] 3 days.
[b] 7 days.
[c] 25 days.
[d] 1 day.
[e] 6 days.
[f] 4 days.
[g] 14 days.
[h] 5 days.
[i] 21 days.

Evaporation of Androscoggin River at Lewiston, 1905–1907—Continued.

Period.	Average temperature of air in degrees F.	Average temperature of water, degrees F.		Average relative humidity (per cent).	Average anemometer reading (miles daily).	Total precipitation in inches.	Evaporation in inches.			
		Outside pan.	In pan.				Total.	Average.	Maximum.	Minimum.
1907.										
Feb. 1–8	14.7	....	....	70.0	99.0	0.76	0.14	0.018	0.04	0.00
Feb. 9–16	18.1	....	....	68.6	86.0	.23	[a] .19	[a] .027	.05	.01
Feb. 17–24	15.2	....	....	66.9	118	.55	[a] .23	[a] .033	.08	.01
Feb. 25–28	11.6	....	....	59.2	141	.75	.13	.032	.05	.02
Mean 1–28	14.9	....	....	66.2	111	2.29	[b] .69	.026	.08	.00
Mar. 1–8	18.8	....	....	66.0	61.7	.43	.22	.028	.06	.00
Mar. 9–16	26.0	....	....	62.8	61.1	.52	.24	.030	.07	.00
Mar. 17–24	33.1	....	....	52.6	105	1.88	[c] .20	[c] .10	.11	.09
Mar. 25–31	37.2	....	....	56.0	38.3	.18	....	....	....	....
Mean 1–31	28.8	....	....	59.4	66.5	3.01	[d] .66	.037	.11	.00
Apr. 1–8	34.8	....	....	61.0	92.5	1.11	.25	.032	.06	.00
Apr. 9–15	37.7	....	....	60.8	114	3.25	[e] .10	[e] .02	.06	.00
Apr. 16–23	42.5	....	....	43.6	119	....	....	....	....	....
Apr. 24–30	46.4	....	....	81.0	91.0	1.33	....	....	....	....
Mean 1–30	40.4	....	....	61.6	104	5.69	....	....	....	....
May 1–8	48.6	....	....	64.3	92.5	.43	....	....	....	....
May 9–16	52.3	47.7	48.3	58.1	100	.29	.68	.085	.13	.01
May 17–24	52.4	50.8	51.5	51.4	111	.87	.78	.098	.22	.03
May 25–31	49.9	51.3	47.4	62.8	121	.43	.76	.109	.17	.00
Mean 1–31	50.8	[f] 49.9	[f] 49.1	59.2	106	2.02	[g] 2.22	[g] .096	.22	.00
June 1–8	55.1	56.4	56.8	72.5	77.5	1.86	.62	.078	.12	.02
June 9–15	58.6	59.8	60.3	60.1	84.0	.05	.91	.130	.17	.07
June 16–23	70.8	69.8	70.1	68.7	74.6	.04	1.17	.146	.22	.07
June 24–30	72.8	73.5	73.3	70.8	85.4	2.78	1.10	.157	.28	.04
Mean 1–30	64.3	64.9	65.1	68.0	80.4	4.73	3.80	.127	.28	.02
July 1–8	69.3	69.3	70.1	67.8	63.3	.18	1.01	.126	.19	.07
July 9–16	67.7	72.0	72.2	67.4	91.4	.61	1.51	.189	.33	.06
July 17–24	74.0	76.8	77.0	65.9	81.3	.73	1.53	.192	.31	.07
July 25–31	68.0	70.9	70.9	74.4	87.3	1.09	1.03	.147	.30	.05
Mean 1–31	69.8	72.2	72.6	68.9	80.8	2.61	5.08	.164	.33	.05
Aug. 1–8	67.7	71.1	70.9	74.5	71.9	1.87	.85	.106	.18	.03
Aug. 9–16	70.9	73.6	73.9	59.3	85.5	....	1.71	.214	.41	.12
Aug. 17–24	65.5	70.3	70.3	68.0	81.1	.32	1.25	.156	.20	.02
Aug. 25–31	62.5	68.2	68.2	58.2	103	.29	1.38	.197	.23	.10
Mean 1–31	66.6	70.8	70.8	65.0	85.4	2.48	5.19	.168	.41	.02
Sept. 1–8	62.5	64.4	64.8	80.8	60.2	2.03	.58	.072	.17	.00
Sept. 9–15	64.4	65.1	65.5	78.7	70.9	.39	.63	.090	.15	.04
Sept. 16–23	62.6	65.5	65.5	68.0	59.6	1.01	.97	.121	.23	.03
Sept. 24–30	53.1	60.2	60.0	72.2	100	3.44	.75	.107	.24	.00
Mean 1–30	60.6	63.8	64.0	74.9	72.7	6.87	2.93	.098	.24	.00
Oct. 1–8	51.6	51.0	51.2	70.8	93.8	1.72	.45	.056	.10	.00
Oct. 9–16	49.4	49.0	49.1	65.0	68.2	.06	.61	.076	.17	.04
Oct. 17–24	44.4	45.3	45.1	54.0	104	.02	.64	.080	.17	.02
Oct. 25–31	40.4	41.1	41.3	64.2	132	1.83	.40	.057	.12	.00
Mean 1–31	46.4	46.6	46.7	63.5	99.5	3.63	2.10	.068	.17	.00

[a] 7 days. [b] 26 days. [c] 2 days. [d] 18 days. [e] 5 days. [f] 4 days. [g] 23 days.

Evaporation of Mooselookmeguntic Lake at upper dam, 1905–1907.

Period.	Average temperature of air in degrees F.	Average temperature of water, degrees F.		Average relative humidity (per cent).	Average anemometer reading (miles daily).	Total precipitation in inches.	Evaporation in inches.			
		Outside pan.	In pan.				Total.	Average.	Maximum.	Minimum.
1905.										
Aug. 19–24	....	66.9	65.8	....	....	....	0.92	0.153	0.18	0.12
Aug. 25–31	....	65.4	64.1	....	....	0.71	.94	.134	.20	.10
Mean 19–31	....	66.2	65.0	....	....	.71	1.86	.143	.20	.10
Sept. 1–8	....	63.8	62.7	....	....	.58	[a] .63	[a] .126	.15	.11
Sept. 9–15	....	62.8	60.6	....	....	.42	[a] .68	[a] .136	.23	.09
Sept. 16–23	....	61.4	59.6	....	....	2.51	[b] .49	[b] .082	.14	.03
Sept. 24–30	....	54.6	51.9	....	....	....	.71	.101	.18	.04
Mean 1–30	....	60.6	58.7	....	....	3.51	[c] 2.51	[c] .109	.23	.03
Oct. 1–8	....	56.1	54.6	....	....	....	.87	.109	.17	.05
Oct. 9–16	....	51.4	50.0	....	....	.45	.51	.064	.11	.05
Oct. 17–24	....	49.0	46.2	....	....	.34	.64	.080	.18	.00
Oct. 25–31	....	45.1	41.2	....	....	....	.54	.077	.09	.06
Mean 1–31	....	50.4	48.0	....	....	.79	2.56	.083	.18	.00
1906.										
May 20–24	54.0	45.6	46.3	57.1	86.0	....	.24	.048	.09	.02
May 25–31	52.7	47.6	48.1	66.8	116.0	1.92	.37	.053	.15	.00
Mean 20–31	53.4	46.6	47.2	62.0	101.0	1.92	.61	.051	.15	.00
June 1–8	57.9	50.4	51.2	78.9	71.8	1.00	[d] .10	.050	.07	.03
June 9–16	58.7	55.4	56.4	65.6	136.0	.56	.30	.038	.13	.03
June 17–24	63.5	62.1	62.5	78.6	120.0	1.99	.30	.038	.14	.00
June 25–30	63.3	62.3	62.7	72.4	110.0	.28	.40	.067	.13	.06
Mean 1–30	60.9	57.6	58.2	73.9	110.0	3.83	[e] 1.10	[e] .039	.14	.00
July 1–8	62.1	65.2	64.9	67.4	83.5	.63	.80	.100	.15	.00
July 9–16	68.5	70.4	69.9	79.4	58.0	1.16	.80	.100	.17	.03
July 17–24	68.9	70.3	69.9	80.2	84.0	.75	.95	.119	.24	.03
July 25–31	70.0	72.5	71.9	76.1	66.6	.77	.73	.104	.17	.00
Mean 1–31	67.4	69.6	69.2	75.8	73.0	3.31	3.28	.106	.24	.00
Aug. 1–8	77.6	74.2	73.9	77.6	42.2	.06	1.15	.144	.19	.08
Aug. 9–16	62.3	71.4	70.0	71.1	138.0	.08	1.92	.240	.32	.15
Aug. 17–24	70.3	70.6	70.8	70.4	65.2	.34	.86	.108	.21	.07
Aug. 25–31	60.0	68.1	68.3	76.9	101.0	.89	1.17	.167	.31	.03
Mean 1–31	67.6	71.1	70.8	74.0	86.6	1.37	5.10	.164	.32	.03
Sept. 1–8	53.9	60.8	59.4	78.3	143.0	.71	1.03	.129	.22	.07
Sept. 9–16	62.5	63.9	63.4	78.0	84.0	.48	.80	.100	.18	.05
Sept. 17–24	59.4	62.5	61.1	80.2	102.0	.53	.90	.112	.23	.03
Sept. 25–30	49.9	58.2	57.6	76.6	118.0	.66	.77	.128	.20	.06
Mean 1–30	56.4	61.3	60.4	78.3	112.0	2.38	3.52	.117	.23	.07
Oct. 1–8	49.3	56.5	55.6	82.8	132.0	.17	.99	.124	.20	.04
Oct. 9–16	45.0	52.7	51.4	86.8	115.0	1.25	.60	.075	.11	.03
Oct. 17–24	51.0	51.1	50.6	81.7	82.0	.64	.49	.061	.08	.04
Oct. 25–31	45.4	47.9	46.3	84.2	180.0	1.07	.48	.068	.14	.02
Mean 1–31	47.7	52.0	51.0	83.9	127.0	3.13	2.56	.083	.20	.02
Nov. 1–8	40.7	40.6	38.3	71.1	159.0	.09	.69	.086	.11	.07
Nov. 9–11	38.6	37.6	35.8	88.0	83.0	.13	.02	.007	.02	.00
Mean 1–11	39.6	39.1	37.0	79.5	121.0	.22	.71	[f] .064	.11	.00
1907.										
June 8–15	....	53.2	54.1	....	82.8	.21	.48	.060	.12	.00
June 16–23	....	61.1	62.3	....	92.4	1.22	.60	.075	.16	.00
June 24–30	....	63.3	64.0	....	142.0	1.42	.60	.086	.13	.00
Mean 8–30	....	59.2	60.2	....	106.0	2.85	1.68	.073	.16	.00

[a] 5 days. [b] 6 days [c] 23 days. [d] 2 days. [e] 28 days. [f] 11 days.

Evaporation of Mooselookmeguntic Lake at upper dam, 1905–1907—Continued.

Period.	Average temperature of air in degrees F.	Average temperature of water, degrees F.		Average relative humidity (per cent).	Average anemometer reading (miles daily).	Total precipitation in inches.	Evaporation in inches.			
		Outside pan.	In pan.				Total.	Average.	Maximum.	Minimum.
1907.										
July 1–8	....	64.5	64.6	....	88.5	0.87	0.85	0.106	0.17	0.03
July 9–16	....	64.5	64.5	....	136.0	.81	.67	.084	.15	.04
July 17–24	....	67.1	67.4	....	122.0	.73	.90	.112	.20	.03
July 25–31	....	66.1	65.8	....	142.0	1.33	.85	.121	.20	.04
Mean 1–31	....	65.6	65.6	....	122.0	3.74	3.27	.105	.20	.03
Aug. 1–8	....	65.3	65.0	....	89.0	1.00	.74	.092	.15	.02
Aug. 9–16	....	66.0	65.9	....	143.0	.00	1.13	.141	.26	.02
Aug. 17–24	....	64.9	64.3	....	116.0	.00	.88	.110	.22	.04
Aug. 25–31	....	61.6	60.1	....	201.0	.42	1.07	.153	.24	.09
Mean 1–31	....	64.4	63.8	....	137.0	1.42	3.82	.123	.26	.02
Sept. 1–8	61.0	60.2	59.9	91.0	123.0	2.32	.42	.052	.12	.00
Sept. 9–15	63.7	61.4	61.1	87.4	114.0	.85	.41	.059	.11	.00
Sept. 16–23	63.7	61.5	60.5	83.4	118.0	.87	.82	.102	.16	.04
Sept. 24–30	49.6	55.8	54.2	83.8	191.0	1.17	.49	.070	.15	.00
Mean 1–30	59.5	59.7	58.9	86.4	136.0	5.21	2.14	.071	.16	.00
Oct. 1–8	51.2	52.9	51.8	82.4	150.0	1.92	.55	.069	.13	.00
Oct. 9–16	45.8	49.9	48.7	86.0	123.0	.47	.63	.079	.14	.04
Oct. 17–24	42.2	47.0	44.7	60.8	192.0	.00	.84	.105	.17	.04
Oct. 25–29	40.2	44.2	42.3	79.7	169.0	1.31	.24	.048	.10	.00
Mean 1–29 [a]	44.8	48.5	46.9	77.2	158.0	3.70	2.26	.078	.17	.00

[a] 30–31 missing.

SUMMARY OF OBSERVATIONS.

The following tables give a comparison of the weekly and monthly evaporation at the four stations:

Evaporation from water surface, in inches, for weekly periods, 1905–1908.

Period.	Soldier Pond.	Millinocket.	Lewiston.	Mooselookmeguntic Lake.
1905.				
July 1–8	0.72	1.01	0.96	....
July 9–16	1.38	1.50	1.88	....
July 17–24	1.25	1.82	2.09	....
July 25–31	.95	1.22	1.06	....
Aug. 1–8	1.36	1.27	.82	....
Aug. 9–16	1.44	1.56	1.20	....
Aug. 17–24	1.35	1.59	1.16	....
Aug. 25–31	1.10	1.38	1.14	0.94
Sept. 1–8	.63	.70	.54	[a] .63
Sept. 9–15	.95	1.00	.94	[a] .68
Sept. 16–23	.48	.60	.52	[b] .49
Sept. 24–30	.59	1.02	1.02	.71
Oct. 1–8	.56	.92	.83	.87
Oct. 9–16	.53	.69	.76	.51
Oct. 17–24	[a] .30	.74	.56	.64
Oct. 25–31	.12	.59	.39	.54
Nov. 1–8	[c] .11	.30	.25	....
Nov. 9–15	....	.24	[b] .13	....

[a] 5 days. [b] 6 days. [c] Nov. 1–7.

Evaporation from water surface, in inches, for weekly periods, 1905–1908—Continued.

Period.	Soldier Pond.	Millinocket.	Lewiston.	Mooselookmeguntic Lake.
1906.				
Apr. 1–8	....	....	.87	....
Apr. 9–15	....	....	[a] .38	....
Apr. 16–23	....	....	[b] 1.24	....
Apr. 24–30	....	....	.41	
May 1–8	[c] .33	....	.28	....
May 9–16	.35	....	.49	....
May 17–24	.52	....	.95	....
May 25–31	.47	....	.42	.37
June 1–8	.42	....	.40	[d] .10
June 9–15	.77	....	1.13	[e] .30
June 16–23	1.10	....	.86	[f] .30
June 24–30	.59	....	.47	[g] .40
July 1–8	.97	1.49	1.26	.80
July 9–16	.87	.93	1.07	.80
July 17–24	1.20	1.15	1.32	.95
July 25–31	1.30	1.23	1.14	.73
Aug. 1–8	1.60	1.43	1.29	1.15
Aug. 9–16	1.52	2.10	2.04	1.92
Aug. 17–24	1.25	1.19	1.30	.86
Aug. 25–31	.97	1.19	1.33	1.17
Sept. 1–8	.81	1.61	1.58	1.03
Sept. 9–16	.85	1.23	1.11	.80
Sept. 17–24	.85	1.11	1.14	.90
Sept. 25–30	.59	.55	.90	.77
Oct. 1–8	.70	[h] .47	.92	.99
Oct. 9–16	.50	[h] .53	.64	.60
Oct. 17–24	.44	.47	.33	.49
Oct. 25–31	.35	.35	.41	.48
Nov. 1–8	.57	.61	.62	.69
Nov. 9–16	....	.31	.09	....
1907.				
Jan. 1–8	....	....	[i] .13	....
Jan. 9–16	....	....	[j] .16	....
Jan. 17–24	....	....	[j] .08	....
Jan. 25–31	....	....	.10	....
Feb. 1–8	....	....	.14	....
Feb. 9–16	....	....	[k] .19	....
Feb. 17–24	....	....	[k] .23	....
Feb. 25–28	....	....	.13	....
Mar. 1–8	....	....	.22	....
Mar. 9–16	....	....	.24	....
Mar. 17–24	....	....	[l] .20	....
Mar. 25–31	....	....	....	....
Apr. 1–8	....	....	.25	....
Apr. 9–15	....	....	[j] .10	....
Apr. 16–23	....	....	....	....
Apr. 24–30	....	....	....	....
May 1–8	.26	[j] .31	....	....
May 9–16	.34	[k] .57	.68	....
May 17–24	.39	[m] .51	.78	....
May 25–31	.41	.76	.76	....
June 1–8	.40	.63	.62	....
June 9–15	.64	.77	.91	[n] .48
June 16–23	.68	.84	1.17	.60
June 24–30	.38	.61	1.10	.60
July 1–8	.70	.85	1.01	.85
July 9–16	.80	1.19	1.51	.67
July 17–24	.64	1.28	1.53	.90
July 25–31	.18	.62	1.03	.85

[a] 3 days.
[b] 7 days.
[c] May 3–8.
[d] 2 days.
[e] June 9–16.
[f] June 17–24.
[g] June 25–30.
[h] 5 days.
[i] 4 days.
[j] 5 days.
[k] 7 days.
[l] 2 days.
[m] 6 days.
[n] June 8–15.

Evaporation from water surface, in inches, for weekly periods, 1905–1908—Continued.

Period.	Soldier Pond.	Millinocket.	Lewiston.	Mooselookmeguntic Lake.
1907.				
Aug. 1–8	0.69	0.85	0.85	0.74
Aug. 9–16	.80	1.69	1.71	1.13
Aug. 17–24	.95	1.46	1.25	.88
Aug. 25–31	.72	1.39	1.38	1.07
Sept. 1–8	.48	.94	.58	.42
Sept. 9–15	.49	.74	.63	.41
Sept. 16–23	.67	1.16	.97	.82
Sept. 24–30	.39	.88	.75	.49
Oct. 1–8	.53	.90	.45	.55
Oct. 9–16	.57	.76	.61	.63
Oct. 17–24	.67	.90	.64	.84
Oct. 25–31	.29	.42	.40	[a] .24
Nov. 1–8	.34	....	....	....
Nov. 9–15	.13	....	....	....
1908.				
May 12–16	.22	....	....	....
May 17–24	.41	....	....	....
May 25–31	.23	....	....	....
June 1–8	.53	....	....	....
June 9–15	.62	....	....	....
June 16–23	.68	....	....	....
June 24–30	.80	....	....	....
July 1–8	1.00	....	....	....
July 9–16	1.61	....	....	....
July 17–24	1.07	....	....	....
July 25–31	1.01	....	....	....
Aug. 1–8	1.33	....	....	....
Aug. 9–16	1.17	....	....	....
Aug. 17–24	1.08	....	....	....
Aug. 25–31	1.06	....	....	....
Sept. 1–8	.98	....	....	....
Sept. 9–15	1.05	....	....	....
Sept. 16–23	.84	....	....	....
Sept. 24–30	.79	....	....	....
Oct. 1–8	1.06	....	....	....
Oct. 9–16	.75	....	....	....
Oct. 17–24	.83	....	....	....
Oct. 25–31	.33	....	....	....
Nov. 1–7	.21	....	....	....

[a] Oct. 25–29.

Evaporation from water surface, in inches, for monthly periods, 1905–1908.

Period.	Soldier Pond.	Millinocket.	Lewiston.	Mooselookmeguntic Lake.
1905.				
July	4.30	5.55	5.99	....
August	5.25	5.80	4.32	....
September	2.65	3.32	3.02	[a] 2.51
October	[b] 1.51	2.94	2.54	2.56
1906.				
January	....	....	[c] .90	....
February	....	....	[d] 1.05	....
March	....	....	[e] 1.87	....
April	....	....	[f] 2.90	....
May	[g] 1.67	....	2.14	....
June	2.88	....	2.86	[b] 1.10
July	4.34	4.80	4.79	3.28
August	5.34	5.91	5.96	5.10
September	3.10	4.50	4.73	3.52
October	1.99	[b] 1.82	2.30	2.56

[a] 23 days.
[b] 28 days.
[c] 22 days.
[d] 27 days.
[e] 26 days.
[f] 25 days.
[g] 29 days.

Evaporation from water surface, in inches, for monthly periods, 1905–1908—Continued.

Period.	Soldier Pond.	Millinocket.	Lewiston.	Mooselookmeguntic Lake.
1907.				
January	....	....	[a].47	....
February	....	....	[b].69	....
March	....	....	[c].66	....
April	....	....	....	....
May	1.40	[d]2.15	[e]2.22	....
June	2.10	2.85	3.80	....
July	2.32	3.94	5.08	3.27
August	3.16	5.39	5.19	3.82
September	2.03	3.72	2.93	2.14
October	2.06	2.98	2.10	[f]2.26
1908.				
May (12–31)	.86	....	....	....
June	2.63	....	....	....
July	4.69	....	....	....
August	4.64	....	....	....
September	3.66	....	....	....
October	2.97	....	....	....

[a] 21 days. [b] 26 days. [c] 18 days. [d] 25 days. [e] 23 days. [f] Oct. 1–29.

For the purpose of determining an average monthly evaporation, the following table was made:

Comparison of monthly evaporation records.

SOLDIER POND.

Month.	1905	1906	1907	1908	Average.
May	....	[a]1.67	1.40	[b]0.86	(1.5)
June	....	2.88	2.10	2.63	2.5
July	4.30	4.34	2.32	4.69	3.9
August	5.25	5.34	3.16	4.64	4.6
September	2.65	3.10	2.03	3.66	2.9
October	[c]1.51	1.99	2.06	2.97	2.2

MILLINOCKET.

May	....	....	[d]2.15	....	(2.7)
June	....	....	2.85	....	(2.8)
July	5.55	4.80	3.94	....	4.8
August	5.80	5.91	5.39	....	5.7
September	3.32	4.50	3.72	....	3.8
October	2.94	[l]1.82	2.98	....	2.7

LEWISTON.

January	....	[e]0.90	[f]0.47	....	(±1.0)
February	....	[g]1.05	[h].69	....	(±0.8)
March	....	[h]1.87	[i].66	....	(±1.7)
April	....	[d]2.90	....	....	(±2.8)
May	....	2.14	[j]2.22	....	(±2.5)
June	....	2.86	3.80	....	(3.3)
July	5.99	4.79	5.08	....	5.3
August	4.32	5.96	5.19	....	5.2
September	3.02	4.73	2.93	....	3.6
October	2.54	2.30	2.10	....	2.3
November	[k]1.01	....	....	....	(1.3)
December	[k].60	[l].28	....	....	(.7)

MOOSELOOKMEGUNTIC LAKE.

June	....	[c]1.10	....	....	....
July	....	3.28	3.27	....	(±3.3)
August	....	5.10	3.82	....	(±4.5)
September	[j]2.51	3.52	2.14	....	(3.0)
October	2.56	2.56	[m]2.26	....	(2.2)

[a] 29 days.
[b] May 12–31.
[c] 28 days.
[d] 25 days.
[e] 22 days.
[f] 21 days.
[g] 27 days.
[h] 26 days.
[i] 18 days.
[j] 23 days.
[k] 24 days.
[l] 14 days.
[m] Oct. 1–29.

The foregoing table indicates that owing to breaks in the records and their general short extent, only approximate results can be obtained. It is, however, believed that the results given are fairly representative of the evaporation in Maine, especially during that part of the year important in its relation to water storage. During the winter months the relative evaporation at Lewiston is probably larger (as compared with that at the other stations) than during the summer months, since the change in conditions at Lewiston is less during the winter than at the other places.

Figure 3 is a curve showing the monthly evaporation at the four stations and also a composite curve for Maine. It also shows the evaporation from water surface in the vicinity of Boston, as determined by Fitzgerald.

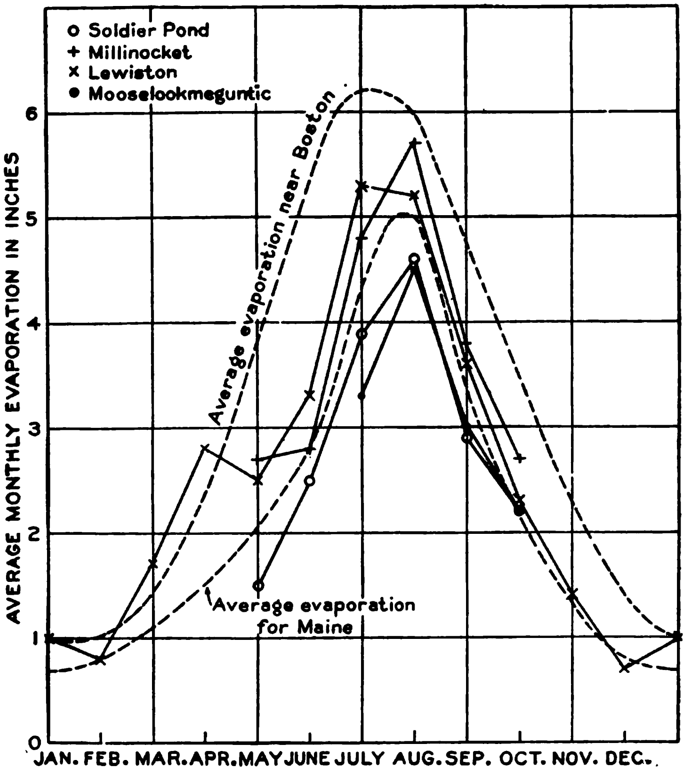

FIGURE 3.—Monthly and average evaporation, in inches, at Maine stations.

As would be expected, the results show that evaporation from water surface in Maine is considerably less than for the vicinity of Boston.

The average annual evaporation from water surface in Maine as shown on figure 3 is about 26 inches, as compared with 39.12 inches at Boston. From May to September the Maine evaporation is about 17.5 inches, as compared with 26.20 inches near Boston.

The importance of records of longer duration and of less interruptions is also evident. The results during the summer months are fairly representative of what may be expected, but the winter period needs further attention.

Comparison of average monthly evaporation, in inches, at Maine stations and at Boston, Mass.

Month.	Soldier Pond.	Millinocket.	Lewiston.	Mooselookmeguntic Lake.	Composite average.	Average evaporation near Boston, Mass.
January			1.0		(±0.7)	0.98
February			0.8		(±0.7)	1.01
March			1.7		(±1.1)	1.45
April			2.8		(±1.6)	2.39
May	1.5	2.7	2.5		(2.1)	3.82
June	2.5	2.8	3.3		(±2.8)	5.34
July	3.9	4.8	5.3	3.3	4.32	6.21
August	4.6	5.7	5.2	4.5	5.00	5.97
September	2.9	3.8	3.6	3.0	3.32	4.86
October	2.2	2.7	2.3	2.2	(2.2)	3.47
November			1.3		(±1.3)	2.24
December			.7		(±.7)	1.38
Total					25.84	39.12

FLOODS ON PENOBSCOT RIVER.

FLOODS AT BANGOR.

Reliable data from which to estimate the flow of Penobscot River during times of great floods are not available, for the scattered records of high water stages that have probably been kept are usually of little value.

The best information regarding floods in the lower Penobscot basin is afforded by a record of flow over the Bangor waterworks dam. This record, though not complete, is fairly satisfactory.

The crest of the dam is triangular in shape, upstream side 2.7 : 1, downstream side 9.2 : 1. The total length between abutments is 764 feet. The height of each abutment is 12 feet. About a quarter way across from the right bank is a log sluice, the bottom of which is 38 feet wide and 5.5 feet below the crest of the dam. The tops of the piers of this log sluice are 9 feet above the crest of the dam, and are 12 feet and 14 feet wide, respectively. The clear length of the dam between the right abutment and pier of log sluice is 145 feet, and the length on the other side is 555 feet. The total length of dam is therefore 738 feet in the clear up to 9 feet elevation, and above that the length is 764 feet.

For computing the discharge over the dam during flood stages a coefficient of discharge has been assumed[1] of 3.50 in the formula $Q=CLH^{\frac{3}{2}}$. A great degree of accuracy is not claimed for these computations, as the dam has not been systematically rated, but it is believed that the figures are sufficiently accurate for studies of flood discharge.

The following rating table is based on the figures given above, but special refinement in its preparation has not been exercised.

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[1] This coefficient has been adopted after a study of Weir experiments, coefficients, and formulas: Water Supply Paper U. S. Geol. Survey No. 200.

Flood rating table for Bangor dam.

Head on crest.	Discharge.	Head on crest.	Discharge.
Feet.	*Second-feet.*	*Feet.*	*Second-feet.*
6.00	41,200	9.50	79,600
6.50	46,200	10.00	85,600
7.00	51,200	10.50	92,000
7.50	56,400	11.00	98,700
8.00	62,000	11.50	105,000
8.50	67,800	12.00	112,000
9.00	73,600	12.25	115,000

The following table gives a record of stage of some of the high-water periods of the Penobscot River at Bangor waterworks dam:

Gage height, in feet, and discharge, in second-feet, of Penobscot River at Bangor water works dam.

[Drainage area, 7,700 square miles.]

Date.	Gage height.	Discharge.
1900.		
Apr. 22	9.0	73,600
Apr. 23	9.2	75,800
Apr. 24	9.0	73,600
Apr. 25	8.8	71,300
Apr. 26	8.6	69,000
Apr. 27	8.2	64,300
Apr. 28	7.9	60,900
Apr. 29	7.5	56,400
Apr. 30	7.0	51,200
May 1	6.8	49,200
May 2	6.7	48,200
May 3	6.6	47,200
May 4	7.6	57,500
May 5	8.6	69,000
May 6	8.1	63,200
May 7	8.8	71,300
May 8	8.5	67,800
May 9	8.1	63,200
May 10	7.9	60,900
May 11	7.8	59,800
May 12	7.3	54,300
May 13	6.8	49,200
May 14	6.5	46,200
May 15	6.0	41,200
May 16	6.5	46,200
May 17	6.6	47,200
May 18	6.3	44,200
May 19	6.2	43,200
May 20	6.7	48,200
May 21	7.4	55,400
May 22	7.7	58,600
May 24	7.4	55,400
May 25	7.1	52,200
May 26	6.8	49,200
May 27	6.5	46,200
1901.		
Apr. 6	7.0	51,200
Apr. 7	8.3	65,400
Apr. 8	10.0	85,600
Apr. 9	10.7	94,700
Apr. 10	12.25	115,000
Apr. 11	11.7	108,000
Apr. 12	11.7	108,000
Apr. 13	10.6	93,300
Apr. 14	10.2	88,200
Apr. 15	9.7	82,000
Apr. 16	9.2	75,800
Apr. 17–30	8.5	67,800
May 1	7.75	59,300
May 2	7.25	53,800
May 3	6.75	48,500
May 4	6.25	43,600
1902.		
Mar. 19	6.6	47,300
Mar. 20	7.3	54,300
Mar. 21	8.6	68,800
Mar. 22	9.8	83,200
Mar. 23	10.3	89,500
Mar. 24	10.1	86,900
Mar. 25	9.5	79,600
Mar. 26	8.8	72,200
Mar. 27	8.1	63,300
Mar. 28	7.6	57,800
Mar. 29	7.3	54,300
Mar. 30	7.6	57,800
Mar. 31	8.3	65,400
1907.		
Apr. 25	6.75	48,500
Apr. 26	7.8	59,900
Apr. 27	8.0	62,000
Apr. 28	8.3	65,400
Apr. 29	8.5	67,800
Apr. 30	8.7	70,500
May 1	8.8	71,800
May 2	9.7	82,000
May 3	10.0	85,600
May 4	9.7	82,000
May 5	9.0	73,600
May 6	8.4	66,600
May 7	7.8	59,800
May 8	7.3	54,300
May 9	6.8	49,200
May 10	6.6	47,300
May 11	6.2	42,300
1909.		
Apr. 15	7.1	52,200
Apr. 16	9.0	73,600
Apr. 17	9.8	83,200
Apr. 18	9.75	82,500
Apr. 19	9.2	75,800
Apr. 20	9.0	73,600
Apr. 21	9.0	73,600
Apr. 22	9.0	73,600
Apr. 23	8.9	72,900
Apr. 24	8.75	70,700
Apr. 25	8.3	65,400
Apr. 26	8.0	62,000
Apr. 27	7.5	56,400
Apr. 28	7.1	52,200
Apr. 29	7.2	53,300
Apr. 30	7.0	51,200
Sept. 29	4.8	30,200
Sept. 30	8.9	72,400
Oct. 1	9.6	80,800
Oct. 2	7.5	56,400
Oct. 3	6.2	43,200
Oct. 4	5.8	39,200

The records indicate that the highest water since the construction of the dam (about 1875) occurred between 3 p. m. and 9.30 p. m. April 10, 1901, when 12.25 feet of water was passing over the dam, corresponding to a discharge of about 115,000 second-feet.

The Twin Lakes reservoir system of the Great Northern Paper Co. on the West Branch of Penobscot River was placed in operation in January, 1901. The storage capacity was originally about 19,000 million cubic feet, but it was subsequently enlarged until at the present time it is 32,000 million cubic feet.

According to the record of discharge over the Millinocket dam, the discharge during the flood of April, 1901, was 22,100 second-feet. The natural flow would not have exceeded 24,000 second-feet, which was the discharge again in April, 1903. This is the maximum discharge for the last 10 years at Millinocket, both with storage and without storage. In May, 1907, the natural discharge would have been practically the same. In the spring flood of 1909 the Millinocket discharge was 21,000 second-feet.

The following table shows the maximum discharge during various flood stages on Penobscot River and its tributaries. The Millinocket record is corrected for storage when necessary.

Maximum discharge of streams, Penobscot River basin.

Dates.		West Branch at Millinocket; drainage area, 1,880 square miles.		Penobscot at West Enfield; drainage area, 6,600 square miles.		Penobscot at Bangor; drainage area, 7,700 square miles.		East Branch at Grindstone; drainage area, 1,100 square miles.		Mattawamkeag at Mattawamkeag; drainage area, 1,500 square miles.		Piscataquis at Foxcroft; drainage area, 286 square miles.	
		Second-feet.	Second-feet per square mile.	Second-feet.	Second-feet per square mile.	Second-feet.	Second-feet per square mile.	Second-feet.	Second-feet per square mile.	Second-feet.	Second-feet per square mile.	Second-feet.	Second-feet per square mile.
Apr.,	1900	......	......	......	......	75,800	9.9	......	......	......	......	......	......
Apr.,	1901	24,000	12.8	......	......	115,000	15.0	......	......	......	......	......	......
Mar.	1902	18,000	9.7	73,000	11.1	89,500	11.6	......	......	......	......	......	......
Apr.,	1902												
Apr.,	1903	24,200	12.9	52,000	7.9	......	......	9,600	8.7	12,000	8.0	6,800	23.8
May,	1904	15,000	8.0	51,000	7.7	......	......	13,200	12.0	17,800	11.9	15,000	52.5
May,	1906	21,000	11.2	60,800	9.2	......	......	12,000	10.9	16,000	10.7	12,000	42.0
May,	1907	23,000	12.2	[a]93,400	14.1	85,600	11.1	17,400	15.8	24,400	16.3	10,700	37.4
Apr.,	1909	21,000	11.2	62,000	9.4	75,800	9.9	15,100	13.7	21,100	14.1	11,200	39.2
May,	1909												
Sept.,	1909	8,500	4.5	96,700	14.6	80,800	10.5	25,700	23.4	13,400	8.9	22,200	77.6

[a] Doubtful, owing to possibility of ice affecting discharge.

Contrasted with the high stages due to heavy rainfall are the so-called "floods" caused by backwater from ice jams.

On March 19 and 20, 1902, the city of Bangor was flooded as a result of an ice jam in the "Narrows," about 3 miles below the city. Exchange Street and Broad Street nearly to Main Street, in the business section, were entirely under water. One span of the highway bridge between Bangor and Brewer, and two spans of the Maine Central Railroad bridge, together with one pier, were lifted from their foundations and swept into the river. The main jam that flooded the town was due to ice gorge at the "Narrows"; damage to the two bridges was caused by a smaller secondary jam against the pier of the railroad bridge. At the Bangor dam the discharge was 89,500 second-feet on March 23, according to the record. The discharge at this time over the Bangor dam probably represents approximately the true discharge of the river, as the effect of the ice jam below the city was not felt at the dam.

Discharge records for this period are available only for Millinocket, West Enfield, and the Bangor dam. The actual discharge over the Millinocket dam up to the end of March, 1902, had not exceeded 10,000 second-feet. The flood height here did not occur until April 7, when the discharge was only 15,000 second-feet. The greater part of the water backed up by the ice jam must have come from the Mattawamkeag and Piscataquis and the lower tributaries. The discharge at West Enfield was only 73,000 second-feet, an amount surpassed by the floods of May, 1907, and of September, 1909.

FLOOD OF SEPTEMBER 26 TO 29, 1909.

The flood of September, 1909, is especially noteworthy in that it was due solely to abnormal precipitation following a period of drought.

A general deficiency in precipitation existed in the State of Maine from about June, 1908, to September, 1909. Although the precipitation for the first four months of 1909 was above the normal, it was mostly in the form of snow which, because of the frozen ground, passed off without materially increasing the ground-water supply. During the summer of 1909 the rivers fell to a low pitch and the prospects during early September were for very low water during the fall and winter.

The drought was brought to an end on September 26, when a general rain began, which lasted three days and was heaviest on the third day. The rainfall was unusually heavy in the central and eastern parts of the State, and the rivers were at flood stage for several days.

The rainfall was perhaps the heaviest in the upper Kennebec basin, but the resulting flood was most destructive on Piscataquis River and its branch, Pleasant River.

Damage resulted from washouts and log jams which carried away bridges. A locomotive was derailed by a culvert washout near West Seboois and the engineer was killed. Shipping was delayed for several days.

Rainfall, in inches, Sept. 26 to 30, 1909.

	26	27	28	29	30	Total.
Danforth	1.00	1.50	1.30	1.20	0	5.00
Debsconeag	.30	1.58	2.66	2.91	0	7.45
Greenville	1.98	1.20	3.78	0	0	6.96
Houlton						[a]6.10
Millinocket	0	2.15	1.49	3.23	.15	7.02
Orono	.65	2.06	.87	2.62	0	6.20
Patten	0	2.35	1.00	2.60	0	5.95
The Forks	0	0	4.25	0	.15	4.40

[a] Total for storm. No details available.

The following table shows the range of the flood in the Penobscot and its branches and the maximum and minimum discharges. The sudden rise of the waters, coming when the lakes and ground-water level were both low and would presumably supply much storage, testifies to the intensity of the rainfall.

Comparative flood flow of streams in Penobscot River basin.

Stream.	Drainage area in square miles.	Previous minimum discharge.			Previous maximum discharge.		
		Date.	Second-feet.	Second-feet per square mile.	Date.	Second-feet.	Second-feet per square mile.
West Branch at Millinocket [a]	1,880	Jan. 2, 1904	141	0.07	Apr., 1903	24,200	12.9
Penobscot at West Enfield	6,600	Oct. 12, 1903	1,600	.24	May 2, 1907	[b] 93,400	14.1
Penobscot at Bangor Dam	7,700				Apr. 10, 1901	115,000	15.0
East Branch at Grindstone	1,100	Feb., 1909	105	.10	May 2, 1907	17,400	15.8
Mattawamkeag at Mattawamkeag	1,500	Oct., 1905	86	.06	May 6, 1907	24,400	16.3
Piscataquis at Foxcroft	286	Sept., 1908	15	.05	May 11, 1904	15,000	52.5

Stream.	Record for Sept. 26, 1909.			Flood of Sept. 26-30, 1909.		
	Gage height in feet.	Discharge.		Maximum gage height in feet.	Discharge.	
		Second-feet.	Second-feet per square mile.		Second-feet.	Second-feet per square mile.
West Branch at Millinocket [a]		2,155	1.14		2,280	1.21
Penobscot at West Enfield	2.4	4,160	.63	17.8	96,700	14.6
Penobscot at Bangor Dam	4.8	30,200	3.9	9.6	80,000	10.5
East Branch at Grindstone	4.65	430	.39	14.3	25,700	23.4
Mattawamkeag at Mattawamkeag	4.0	660	.44	10.3	13,400	8.9
Piscataquis at Foxcroft	1.7	31	.11	14.9	22,200	77.6

[a] Actual discharge from storage. [b] Doubtful, owing to possibility of ice affecting discharge.

Attention should be called to the seeming discrepancies between the discharge at West Enfield and at the Bangor dam during this flood. The maximum for West Enfield, 96,700 second-feet was the peak, whereas 73,600 second-feet was the average for the day during which that peak occurred. At the Bangor dam 80,800 second-feet was the average for the maximum day.

The run-off from this storm was peculiarly distributed. The reservoir system on the West Branch held it all. The record at Millinocket was simply the flow as ordinarily used through the mill. Even at that point the computed maximum discharge, unaffected by storage, was only 8,500 second-feet, the actual discharge being 2,280 second-feet.

The rainfall over the Mattawamkeag basin was distributed over a greater length of time and was somewhat less in amount than in the other areas considered, as shown by the Danforth precipitation record. The basin as a whole is wider in comparison to its length than is that of the East Branch. Finally, the slope of the main river from the mouth to North Bancroft or to the mouth of Baskahegan Stream is only 4.5 feet per mile, just about one-half the slope per mile of the East Branch. It would be natural to expect a very much less run-off per square mile from the Mattawamkeag than from the East Branch.

The East Branch of Penobscot River from the mouth to First Grand Lake has a slope of 8.8 feet per mile. The record at Grindstone showed a higher run-off during this storm—23.4 second-feet per square mile—than at any time since the station was established in 1902. The operation of the Grand Lake dam at this time was as follows: From June 13 to July 10 the dam was open while the East Branch drive was going from the dam to the boom; after July 10 the Grand Lake gates were shut in order to store water for the West Branch drive, which came down later. The gates remained shut until September 1, when the West Branch drive reached Medway, when they were opened and kept open until late in the fall. The flood on the East Branch was therefore unaffected by artificial storage.

The center of the storm apparently passed across the Piscataquis, the West Branch, and the center and head of the East Branch basins. The immense lake system, both natural and artificial, of the West Branch absorbed the flood; the quick-spilling basins of the Piscataquis and East Branch showed a high unit run-off.

Records for the Foxcroft station on the Piscataquis showed a very high run-off—77.6 second-feet per square mile. Previous records show that the Piscataquis drains a basin of unusually high unit run-off, at least for the State of Maine. The Foxcroft station is comparatively high up, the drainage area at that point being 286 square miles, and that for the entire Piscataquis basin being 1,500 square miles.

The maximum discharge of the Penobscot at West Enfield was 96,700 second-feet. The combined discharge of the West and East branches and the Mattawamkeag was about 41,300 second-feet, leaving 55,400 second-feet to be contributed by the Piscataquis and the remaining area of the main river, which is 620 square miles. If 5,000 second-feet be assumed as the discharge for this area, it would leave about 50,000 second-feet as the amount coming from the entire Piscataquis basin. Distributed evenly over the basin, this would amount to 33.4 second-feet per square mile; but 22,200 second-feet came from the 286 square miles above Foxcroft; therefore 27,800 second-feet came from the remaining 1,214 square miles of the Piscataquis basin, or 22.9 second-feet per square mile.

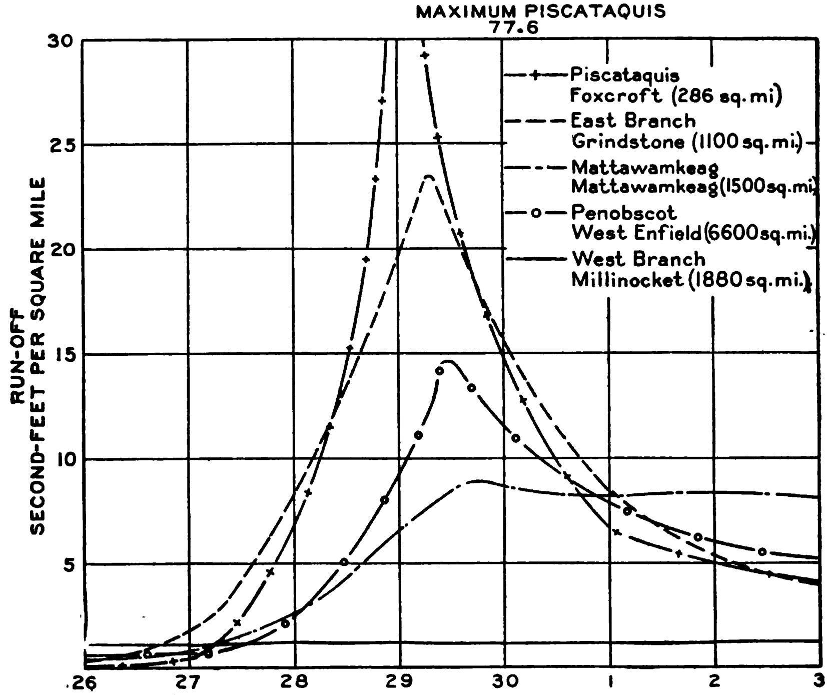

FIGURE 4.—Run-off of Penobscot River and tributaries during storm of September, 1909.

Figure 4 shows graphically the extent and distribution of the run-off during and after the storm, and incidentally the effect and great value of storage on certain of the tributaries.

The total run-off during the storm has been computed approximately, considering the period September 27 to October 2, inclusive, with the following results:

Total run-off in Penobscot River basin, Sept. 27 to Oct. 2, 1909.

Station.	Total run-off, Sept. 27–Oct. 2.	Probable total rainfall for drainage area, Sept. 27–Oct. 2.	Ratio of run-off to rainfall.
	Inches.	*Inches.*	
Piscataquis at Foxcroft	2.59	6.5	0.40
East Branch at Grindstone	2.22	6.5	.34
Mattawamkeag at Mattawamkeag	1.32	5.5	.24
Penobscot at West Enfield	1.43	6.3	.23
West Branch at Millinocket	.26	7.0	.04

The ratio of run-off to rainfall shown in the foregoing table is somewhat less than true value, particularly in the Mattawamkeag basin, where the run-off directly due to this storm continued for some time after October 2.

LOW-WATER CONDITIONS.

Run-off records covering long periods have been kept on various rivers in the State of Maine. The Penobscot River records date back to 1887; those for the Androscoggin, at Rumford Falls, to 1892; those for Kennebec River, at Waterville, to 1893. These records indicate a continued drought from 1902 to 1908, the most severe occurring in 1903 and 1904. Various rainfall records confirm this, as is shown clearly by the Orono mass curve of precipitation on page 19. A mass curve for the Lewiston rainfall, used in other studies, adds further confirmation. The more important gaging stations in the Penobscot basin were established as follows: Millinocket in 1901; Grindstone, West Enfield, Mattawamkeag, and Piscataquis in 1902. It is probable, therefore, that these records cover the period of minimum run-off during the last 25 years.

The following tables give the minimum run-off at the various stations in the basin for the years 1903, 1904, 1905, and 1908:

Run-off of Penobscot River during low-water periods, based on observations from 1902 to 1909.

West Branch of Penobscot River at Millinocket.

[Drainage area, 1,880 square miles.]

Period.	Mean discharge.		Period.	Mean discharge.		Period.	Mean discharge	
	Second-feet.	Second-feet per square mile.		Second-feet.	Second-feet per square mile.		Second-feet.	Second-feet per square mile.
1904.			1905.			1908.		
Feb. 22-27	320	0.17	Dec. 20-26	351	0.19	(a)		
Jan. 1-31	328	.17	Jan., 1906	403	.21			
Jan. to Mar	407	.22	Nov., 1905–Jan., 1906	415	.22			
Oct., 1903–Mar., 1904	471	.25	Nov., 1905–Apr., 1906	646	.34			
June, 1903–May, 1904	1,560	.83						

[a] Records October to December not available.

Run-off of Penobscot River during low-water periods, based on observations from 1902 to 1909—Continued.

Penobscot River at West Enfield.

[Drainage area, 6,600 square miles.]

Period.	Mean discharge.		Period.	Mean discharge.		Period.	Mean discharge.	
	Second-feet.	Second-feet per square mile.		Second-feet.	Second-feet per square mile.		Second-feet.	Second-feet per square mile.
1903.			1905.			1908.		
Oct. 7-13	2,030	0.31	Oct. 24-30	1,850	0.28	Sept. 28-Oct. 3.	2,460	0.37
Oct. 1-31	2,260	.34	Nov. 1-30	2,630	.40	Oct. 1-31	3,450	.52
Oct. 1-Dec. 14	[a] 2,570	.39	Sept.-Nov	3,150	.48	Oct.-Dec	3,820	.58
July 1-Dec. 14	[a] 4,220	.64	June-Nov	4,730	.72	July-Dec	4,940	.75

East Branch of Penobscot River at Grindstone.

[Drainage area, 1,100 square miles.]

1903.			1905.			1908.		
Oct. 7-13	253	0.23	Oct. 25-31	156	0.14	Dec. 14-31	[c] 100	[d] 0.09
Oct. 1-31	342	.31	Oct. 1-31	220	.20	Dec. 1-31	[c] 175	.16
Sept.-Nov	493	.45	Sept.-Nov	501	.46	Dec., 1908-Feb., 1909	[c] 217	.20
([b])			([b])			Oct., 1908-Mar., 1909	[c] 282	.26

Mattawamkeag River at Mattawamkeag.

[Drainage area, 1,500 square miles.]

1903.			1905.			1908.		
Oct. 12-18	120	0.08	Oct. 4-10	[d] 86	0.06	Sept. 23-29	88	0.06
Oct. 1-31	242	.16	Oct. 1-31	99	.07	Sept. 1-30	191	.13
Sept.-Nov	485	.32	Aug.-Oct	186	.12	Aug.-Oct	354	.24
June-Nov	634	.42	July-Dec.[e]	516	.34	July-Dec	527	.35

Piscataquis River at Foxcroft.

[Drainage area, 286 square miles.]

1903.			1905.			1908.		
Sept. 28-Oct. 3	[d] 19	0.07	Oct. 25-31	37	0.13	Nov. 17-23	15	0.05
Sept. 1-30	43	.15	Oct. 1-31	76	.27	Nov. 1-30	68	.24
Sept.-Oct	51	.18	Sept.-Nov	87	.30	Sept.-Nov	85	.30
July-Dec	111	.39	July-Dec	111	.39	July-Dec	107	.37

Phillips Lake at Holden.[f]

[Drainage area, 12.3 square miles.]

Period.	Mean discharge.	
	Second-feet.	Second-feet per square mile.
1904.		
Sept. 1-30	1.71	0.14
Sept.-Nov	2.74	.22
July-Dec	5.1	.41
July, 1904-June, 1905	13.4	1.09

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[a] Nearly.

[b] Records incomplete; see remarks p. 56.

[c] Estimated.

[d] Constant flow.

[e] 16 days in December.

[f] Records for 1904-7.

Run-of of Penobscot River during low-water periods, based on observations from 1902 to 1909—Continued.

Cold Stream at Enfield.

[Drainage area, 26 square miles.]

Period.	Mean discharge.	
	Second-feet.	Second-feet per square mile.
1905.		
Aug. 9-15	[a] 4	0.15
Aug. 1-31	7	.27
Nov., 1905-Jan., 1906	[b] 16	.62
Oct., 1905-Mar., 1906	16	.62
Apr., 1905-Mar., 1906	26	1.00

Kenduskeag Stream near Bangor.[c]

[Drainage area, 191 square miles.]

Period.	Second-feet.	Second-feet per square mile.
1908.		
Sept. 15-20 [d]	7	0.04
Sept. 1-30	[e] 7	.04
Aug.-Oct.	[e] 20	.10

[a] Records from Aug. 12 to 18, 1905.
[b] Records from January to March, 1906.
[c] Records for Sept. 15, 1908, to Oct. 31, 1909, only.
[d] Constant for 17 days Sept. 15 to Oct. 1, inclusive (see [a]).
[e] Estimated.

On account of ice during the months of January, February, and March, and occasionally during December, it is not possible to obtain a complete record for 12 months of each year at each station. Attention should therefore be called to the fact that on certain streams it is not improbable that the extreme minimum may have occurred during a time for which no data are available. This will explain why no run-off is given for the lowest 12-month periods at the stations at West Enfield, Grindstone, Foxcroft, Mattawamkeag, or for the 6-month period at Grindstone.

The minimum run-off for 12 consecutive months for these stations probably occurred as follows:

Minimum run-off at stations in Penobscot River basin.

Place.	Date.	Discharge.	
		Second-feet.	Second-feet per square mile.
West Enfield	May, 1903-April, 1904	8,600	1.3
Grindstone	April, 1903-March, 1904	1,900	1.7
Foxcroft	April, 1903-March, 1904	510	1.8
Mattawamkeag	April, 1905-March, 1906	1,950	1.3

The minimum run-off for six consecutive months for Grindstone doubtless occurred from September, 1903, to February, 1904, although the only data available covering this period extend from September to November, during which time the mean discharge was 0.45 second-foot per square mile. Another very low 6-month run-off occurred October, 1908, to March, 1909, with estimated flow of 0.28 second-foot per square mile.

At Foxcroft other low periods were as follows: August 1 to 14, 1908, the run-off was a constant flow of 22 second-feet, corresponding to 0.08 second-foot per square mile. The mean flow for the month of August, 1909, was 52 second-feet or 0.18 second-foot per square mile.

At Phillips Lake the lowest recorded gage reading is 1.4 feet, corresponding to a flow at the northern outlet of 0.11 second-foot per square mile. For this stage of the lake the flow at the southeast outlet is almost inappreciable. The following number of consecutive days is recorded as having this minimum flow:

1904.	Days.	1905.	Days.
August	6	September	22
September	20	October	14

The great advantage and effect of reservoir storage is seen when comparing the actual discharge of the West Branch at Millinocket with what it would have been without storage. The following table brings these facts out. It will be noticed that the low actual flow occurs a month or so later than the low flow when corrected by storage. Storage increases the low flow from three to four times.

Minimum discharge, West Branch of Penobscot River, at Millinocket as observed and as corrected for storage.

[Drainage area, 1,880 square miles.]

As observed.			As corrected for storage.		
Period.	Mean discharge.		Period.	Mean discharge.	
	Second-feet.	Second-feet per square mile.		Second-feet.	Second-feet per square mile.
January 1-31, 1904	328	0.17	September 1-30, 1903	110	0.06
January to March, 1904	407	.22	September to November, 1903.	254	.14
October, 1903, to March, 1904	471	.25	September, 1903, to February, 1904	319	.17
June, 1903, to May, 1904	1,560	.83	May, 1903, to April, 1904	1,440	.77
December 1-31, 1905	403	.21	September 1-30, 1905	[a] 100	.05
November, 1905, to January, 1906	415	.22	September to November, 1905.	165	.09
November, 1905, to April, 1906.	646	.34	August, 1905, to January, 1906	256	.14
May, 1905, to April, 1906	1,820	.97	May, 1905, to April, 1906	1,660	.88

[a] Same discharge the next month, October, 1905.

WATER POWER.

DEVELOPED WATER POWERS.

The utilized water powers in the Penobscot basin are described in the following paragraphs, beginning with the lowest, at Bangor, and taking up first the powers on the main stream and then those on the tributaries. The information was obtained by local examination and personal interviews, and although some of it, especially that relating to the older plants, is only approximate, it is as a whole fairly accurate. At very few sites has the primary power been completely developed.

MAIN STREAM.

1.

Location: Bangor.
Owner: City of Bangor.
Use: Street lights and pumping municipal water supply.
Maximum capacity: 3,200 horsepower.
Normal head: 12 feet.
Dam: Log crib, with fishway, log sluice, and overfall; in fair condition.
Pond: Extends upstream nearly 3 miles. During high water it backs up into the tailrace of the Veazie plant.
Remarks: The plant is in tidal portion of river (range of tide, 8 to 10 feet); extremely high tides submerge dam and stop entire plant; average power available during 9 months of year about 1,600 horsepower; much less during remaining 3 months; steam auxiliary used.

2.

Location: Veazie, 3 miles above Bangor dam.
Owner: Bangor Railway & Electric Co.
Use: Lighting, power, and heat.
Maximum capacity: 2,200 horsepower.
Normal head: 11 feet.
Dam: Wooden crib in fair condition.
Pond: Extends upstream about 2.75 miles and during high water up to Basin Mills Dam.
Equipment: 15 turbines and auxiliary steam plant.
Remarks: Head considerably reduced by backwater from floods.

3.

Location: Basin Mills, Orono, about 6.75 miles from Bangor dam.
Owner: James Walker Co.
Use: Lumber mill and box factory; burned August, 1910.
Maximum capacity: 2,100 horsepower.
Normal head: 10 to 14 feet.
Dam: Wooden crib, in rather poor repair; 1,900 feet long, with a maximum height of 30 feet above bed of river.
Pond: Extends upstream about 1 mile.
Equipment: 13 turbines of diameter 72 inches; 2 of 84 inches; 7 of 48 inches; 8 of 44 inches, many of local make and of old type; auxiliary steam plant of 150 horsepower, used about 7 months in the year.
Remarks: Annual output was about 17,000,000 feet of lumber. Since mills were burned several offers of purchase of power privilege have been made.

4.

Location: Orono, at mouth of Stillwater River (name given to the west channel of the Penobscot).
Owner: International Paper Co. and William Engel Co.
Use: Pulp, paper, and lumber.
Maximum capacity: 2,778 horsepower.
Normal head: Varies from 9 to 24 feet.
Dam: Two log dams in poor condition.
Pond: Upper pond extends upstream to Stillwater dam.
Equipment: International Paper Co. has 12 turbines developing about 2,400 horsepower, under average head of 24 feet, to run grinder units; 1 turbine of 50 horsepower, under head of 10 feet, to run Barker mill; 3 turbines developing 338 horsepower, under head of 9 to 11 feet, to run paper mill.
Remarks: Average daily output of mills 25 tons of paper and 30 tons of pulp.

5.

Location: Stillwater 7 miles above Bangor dam on Stillwater River.
Owner: Orono Pulp & Paper Co.
Use: Pulp and paper manufacture.
Maximum capacity: 1,460 horsepower.
Normal head: 18 feet.
Dam: Partly wooden crib and partly concrete. It is proposed to replace all crib portions with concrete.
Pond: Extends upstream about 2½ miles nearly to Gillman Falls.
Equipment: Special Hercules turbines, 2 of diameter 45 inches, 2 of 33 inches, and 1 of 21 inches. Two Westinghouse generators of 400 kilowatts, and 1 of 200 kilowatt capacity, 3-phase alternating current; auxiliary steam plant of 1,560 horsepower capacity in partial operation throughout the year.
Remarks: The development was completed in 1902.

6.

Location: Great Works, on main river about 10 miles above Bangor dam.
Owner: Penobscot-Chemical Fiber Co.
Use: Manufacture of fiber.
Maximum capacity: 2,800 horsepower.
Normal head: 17 feet.
Dam: Timber, 1,200 feet long, with concrete forebay.
Pond: Extends only a short distance upstream.
Equipment: 17 wheels of various sizes and a generator capacity of 394 kilowatts.
Remarks: The annual output of chemical fiber is 18,000 tons.

7.

Location: Oldtown, 12.25 miles above Bangor dam.
Owner: Bodwell Water Power Co.
Use: (1) The generation and transmission of electric power to the parent company; (2) the Bangor Railway & Electric Co. uses one wheel of 125 horsepower rated capacity under 11 feet head, which develops an average of about 80 horsepower, used to pump water supply for Oldtown and Milford; (3) Oldtown Woolen Co. having an installation of 4 turbines, two of which are Victor turbines of diameter 35 inches and two Hercules of diameter 36 inches, giving a total of 175 horsepower under average head about 10 feet; (4) the Ounegan mills of the American Woolen Co. having 2 S. Morgan Smith turbines of 30-inch diameter with capacity of 100 horsepower under 11 feet head. This plant was formerly known as the Maine Woolen Co., but was purchased by the present concern in February, 1910; (5) the Nekonegan Paper Co. having 18 turbines of 2,400 horsepower rated capacity under a head of 18 feet.

Maximum capacity: 5,800 horsepower.

Normal head: Given above except for plant of the Bodwell Paper Co. This plant operates under 20-foot head.

Dam: Concrete structure 1,100 feet long completed in 1907, costing $60,000.

Pond: Extends up main river 1 mile. Considerable pondage is created back of Orson Island.

Equipment: Given above except for Bodwell Paper Co. This plant has an installation of 9 vertical shaft turbines, 8 of which are of diameter 44 inches, and one small exciter turbine.

Remarks: The Bodwell Paper Co.'s plant is rated at 7,450 horsepower under 20-foot head. This head can seldom be maintained, the average being from 16 to 18 feet. Plant not completed at date of writing. Output has been from 2,500 to 3,000 horsepower.

8.

Location: Enfield, on main stream just above mouth of Piscataquis River, 36.75 miles above Bangor dam.

Owner: International Paper Co.

Use: Manufacture of wood pulp.

Maximum capacity: 2,860 horsepower.

Normal head: 19 feet.

Dam: Log crib 640 feet long built 20 years ago and is in excellent repair.

Pond: Extends 4 miles up river.

Equipment: 24 Victor wheels and connected pulp machinery.

Remarks: Elevation of water surface just below dam 131 feet; output 35 tons of pulp per day.

9.

Location: Millinocket, 2 miles above mouth of East Branch, about 76 miles above Bangor dam.

Owner: Great Northern Paper Co.

Use: Manufacture of pulp and paper.

Maximum capacity: 6,300 horsepower.

Normal head: 25 feet.

Pond: Extends upstream to Dolby power station.

Equipment: Four Hercules turbines of 30 inches diameter and connected pulp and paper machinery.

Remarks: This plant is called the East Millinocket mill.

10.

Location: Millinocket, 1.75 miles above East Millinocket mill.

Owner: Great Northern Paper Co.

Use: Manufacture of pulp and paper.

Maximum capacity: 9,500 horsepower.

Normal head: 50 feet.

Pond: Extends upstream to Shad Pond.

Equipment: Three pairs of Hercules turbines of diameter 39 inches, each pair developing 2,250 horsepower, and two pairs of 30-inch turbines, each developing 1,375 horsepower. Former set used for wooden grinders; latter set for generators.

Remarks: Extra space and settings are ready for one extra pair of grinders and generator wheels. Total power developed at East Millinocket and Dolby plant, 15,800 horsepower. Output, 180 tons of pulp and 130 tons of paper per day.

11.

Location: Outlet of Quakish Lake, 87 miles from Bangor dam.
Owner: Great Northern Paper Co.
Use: Manufacture of pulp and paper.
Maximum capacity: 24,600 horsepower.
Normal head: 110 feet.
Dam and appurtenances: Dam used to divert water of West Branch into Ferguson Lake and through a canal for a distance of about 1.25 miles to the penstock of Millinocket plant. After passing through this plant, water runs down Millinocket Stream and joins West Branch and Shad Pond.
Equipment: Five pairs Rodney Hunt turbines; diameter, 57 inches; rated capacity, 3,900 horsepower per pair, used for grinders; three pairs 36-inch wheels, rated capacity 1,600 horsepower per pair, and two single 24-inch wheels rated horsepower 150 each, used for generators.
Remarks: Total average output of this plant, 300 tons of pulp and 300 tons of paper per day. The capacity of this mill is larger than that of any other paper mill in the world (see Plate II).

PISCATAQUIS RIVER.

1.

Location: Howland.
Owner: Howland Pulp & Paper Co.
Use: Manufacture of pulp and paper.
Maximum capacity: 537 horsepower.
Normal head: 12 feet.
Dam: Timber crib 800 feet long, in poor repair; elevation of crest, 140 feet above sea level.
Equipment: Three S. Morgan Smith wheels, 54 inches, 48 inches and 45 inches diameter; also auxiliary steam plant, 500 horsepower capacity.
Remarks: Capacity of plant, 40 tons of pulp and 24 tons of paper per day.

2.

Location: Mouth of Schoodic Stream, 9 miles above Howland.
Owner: Lovejoy & Dean.
Use: Lumber mill.
Maximum capacity: 50 horsepower.
Normal head: 10½ feet.
Equipment: One Sampson turbine, 23 inches diameter.

3.

Location: East Dover.
Owner: Dover & Foxcroft Light & Heat Co.
Use: Heat, light, and mechanical power.
Maximum capacity: 419 horsepower.
Normal head: 11.5 feet.
Dam: Timber crib built between solid masonry abutments 175 feet long; elevation of crest, 295 feet; built about 50 years ago, and is in fair condition.
Equipment: Three Hercules turbines 39, 48, and 52 inches, respectively, in diameter; two generators developing 300 kilowatts.

4.

Location: Dover and Foxcroft.
Owner: American Woolen Co.
Use: Textile manufacture.
Maximum capacity: 382 horsepower.
Normal head: 22 feet.
Dam: Timber crib about 50 years old, in fair repair; elevation of crest, 327 feet.
Equipment: One 24-inch vertical turbine, one 30-inch horizontal turbine, and one pair of 42-inch horizontal turbines.

5.

Location: Dover and Foxcroft.
Owner: Joint ownership of Mayo & Son, Omer, Clark & Thayer, and Harold Farnum.
Use: Textile and lumber manufacture.
Maximum capacity: 591 horsepower.
Normal head: 12 feet.
Dam: Timber crib 225 feet long, built in 1853, and in poor repair; elevation of crest, 339 feet.
Equipment: For the woolen mill of Mayo & Son, one 51-inch and one 39-inch Hercules turbines, capacity, 386 horsepower; for the sawmill of Omer, Clark & Thayer, two wheels, affording about 175 horsepower; and for the woodworking mill of Harold Farnum, one turbine affording about 30 horsepower.

6.

Location: 1 mile above Foxcroft.
Owner: Dover & Foxcroft Water Co.
Use: Pumping station for city supply.
Maximum capacity: 50 horsepower.
Normal head: 11½ feet.
Dam: Log crib 214 feet long.
Equipment: One turbine wheel and pumps.

7.

Location: Guilford.
Ownership: Piscataquis Woolen Co., Hussey Woolen Co., and Hussey & Goldthwaite.
Use: Textile manufacture and grist.
Maximum capacity: 447 horsepower.
Normal head: 10 feet.
Dam: Concrete structure 165 feet long, 12 feet high, built in 1905, costing $4,000; elevation of crest, 382 feet.
Equipment: For Piscataquis Woolen Co., one 54-inch Chase turbine and two Hercules turbines 36 inches and 51 inches in diameter, respectively, rated capacity, 260 horsepower; for the Hussey Woolen Co., one 51-inch Rodney Hunt wheel of capacity 137 horsepower; for Hussey & Goldthwaite, one wheel developing 50 horsepower.

SMALLER POWERS.

Other small plants on Piscataquis River are as follows:

At Abbot Village, on South Branch of Kingsbury Stream near its mouth, a plant furnishing about 48 horsepower is used to run a sawmill owned by C. W. Brown; another mill within a few hundred feet furnishes about the same head; it would be possible to combine these two plants and obtain 22 feet head at this point.

A dam at Upper Abbot is used for the Abbot Excelsior Co. The available head is 13 feet and the capacity approximately 75 horsepower. There is an old privilege now unused at Blanchard and another at Sherley.

SEBEC RIVER.

1.

Location: Milo.
Owners: Milo Electric Light & Power Co., Boston Excelsior Co., and Milo Lumber Co.
Use: Light, power, and lumber manufacture.
Maximum capacity: 200 horsepower.
Normal head: 12 feet.
Pond: Extends upstream 4 miles.

2.

Location: Outlet of Sebec Lake.
Owner: Wm. A. Appleyard.
Use: Formerly furnished power to run a gristmill, woolen mill, tannery, and carriage shop. All these industries have disappeared.
Maximum capacity: 60 horsepower.
Normal head: 11.5 feet.
Dam: Timber crib in poor repair.
Remarks: Only a part of the fall has been developed by the dam. The stream has considerable slope for some distance below. Power could be increased to advantage.

PLEASANT RIVER.

Location: Brownville.
Owner: United States Pegwood & Shank Co.
Use: Generation of electricity for lighting, and lumber manufacture.
Maximum capacity: 135 horsepower.
Normal head: 11.5 to 14 feet.
Dam: Timber crib 300 feet long.
Equipment: One wheel under 11.5 feet head develops 35 horsepower; one wheel develops 100 horsepower.
Remarks: On the east end of the dam was located a gristmill which burned in the spring of 1909. A new power plant is being erected (fall of 1910) by the Brownville Electric Light & Power Co.

SUMMARY.

Power developed on the main river, 63,598 horsepower, under a total head of 310 feet. Of this amount the Great Northern Paper Co. controls 40,100 horsepower, developed under a head of 185 feet.

On Piscataquis River is developed a total of 2,599 horsepower, under a head of 113.5 feet. This development extends from Howland to Abbot, the total fall in this distance being 281 feet.

Total developed power in Penobscot basin, 66,197 horsepower, under a head of 423.5 feet, exclusive of many small plants scattered over the basin used for sawmills, gristmills, etc.

UNDEVELOPED WATER POWERS.

FALL AVAILABLE.

Of the 230-foot fall on the main river between tidewater and Medway, at the mouth of the East Branch, about 120 feet has been utilized, 100 feet of which is between Bangor and Oldtown, within 13 miles of tidewater. (See Pls. VIII and IX.)

Of the fall of over 800 feet on the West Branch between Medway and Seeboomook, 185 feet is utilized in the plants of the Great Northern Paper Co. at Millinocket, Dolby, and East Millinocket.

On the East Branch between Medway and Chamberlain Lake is a fall of over 700 feet, none of which is utilized.

On the Mattawamkeag between its mouth and North Bancroft, at the confluence of Baskahegan Stream, is a fall of 150 feet, entirely unused.

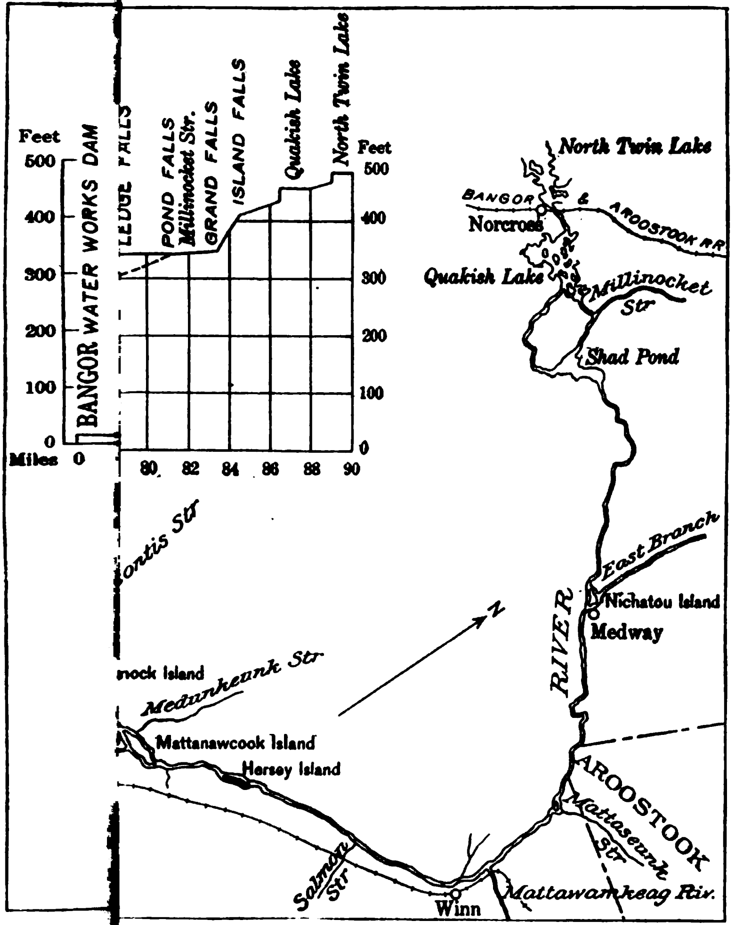
In the Piscataquis basin also there is a large amount of unutilized power, especially on Sebec and Pleasant rivers.

The following brief description of some of the more important unutilized water-power sites are based chiefly on surveys for plans and profiles (see p. 7 and Pls. XIII–XIX at end of volume), but in part on the results of reconnaissance. The suggestions for development include only the more obvious means. Estimates of power at these sites are based on run-off figures contained in the tables on pages 136–139 and include the primary power at present available, as well as that which might be developed under maximum practical storage. As the base figures are not final, the power estimates are only approximate, but it should be remembered that, as the former are very conservative, the latter will hardly be overstated. All statements of horsepower are based on 80 per cent wheel efficiency.

PENOBSCOT RIVER.

Bangor to Oldtown.—The fall of the river above tidewater at Bangor as far as Oldtown is practically all controlled by existing dams except that at Marsh Island rapids, between Orono and Great Works. These rapids begin 7.7 miles from the Bangor dam, at an elevation of 47 feet above sea level, and extend 2.6 miles farther upstream to elevation 65 feet above sea level, and afford a fall of about 18 feet. The banks are high for the entire distance, and a dam could probably be built near the entrance of Blackman Stream that would utilize a considerable part of this undeveloped fall. With efficient operation of present storage facilities this privilege could be made to yield about 6,100 primary horsepower, and with additional development about 7,400 horsepower.

The more complete development of the Penobscot between Oldtown and Bangor has been planned, but the project has not received legislative approval. It is proposed to build a dam on the main river about 1 mile above the Oldtown dam and one on Stillwater Branch, thus diverting at least a portion of the waters through Pushaw Stream into Pushaw Lake. Thence by artificial and natural channels the water will be conducted to some point near Bangor, where, by the use of penstocks, a head of about 110 feet can be obtained at tidewater.


Feet
500
400
300
200
100
0
Miles 0
BANGOR WATER WORKS DAM
LEDGE FALLS
POND FALLS
Millinocket Str.
GRAND FALLS
ISLAND FALLS
Quakish Lake
North Twin Lake
80
82
84
86
88
90
North Twin Lake
BANGOR & AROOSTOOK R.R.
Norcross
Quakish Lake
Millinocket Str
Shad Pond
East Branch
Nichatou Island
Medway
RIVER
N
ontis Str
nock Island
Medunkeunk Str
Mattanawcook Island
Hersey Island
AROOSTOOK
Mattaseunk Str
Salmon Str
Winn
Mattawamkeag Riv.

ANCH).

From the point of view of the engineer the work presents no serious difficulties, but the power developments below the proposed diversion and many other conflicting property interests bring up many serious problems. It is proposed to increase greatly the storage upon the various branches in connection with the project. The cost is estimated at $3,000,000 to $7,000,000, depending upon the plans adopted.

Oldtown to Shad Pond.—From Oldtown to Shad Pond, near Millinocket, the river consists of many rapids separated by stretches of quick water and some comparatively slack water. The following table gives the name, location, elevation, and differences in elevation of a number of controlling points in this distance:

Distances and elevations along Penobscot River between Oldtown and Shad Pond.

Locality.	Distance above Oldtown.	Distance between points.	Elevation above sea level.	Difference in elevations.
	Miles.	*Miles.*	*Feet.*	*Feet.*
Crest of Oldtown dam	12.25		99	
Olamon Stream, outlet	25.5	13.25	111	12
Passadumkeag Rapids, head (crib)	30.75	5.25	128	17
West Enfield dam: Foot	36.7	5.95	131	3
Crest	36.7	0.00	152	21
Mohawk Rapids, foot	42.4	5.70	154	2
Brown Islands	58.6	16.20	169	15
Five Island Rapids: Foot	60.0	1.40	175	6
Head	60.6	.60	182	7
Mattaseunk Stream	65.0	4.40	189	7
Bartlett Brook, head of Mattaseunk Rapids	67.3	2.30	203	14
Joe Mary Rapids	70.7	3.40	224	21
Medway, East Branch	73.6	2.90	230	6
Rockabema Rapids, head	74.7	1.10	245	15
Burnt Land Rapids, head	75.8	1.10	260	15
Shad Pond	82.6	6.80	343	83

NOTE.—The river from Burnt Land Rapids to Shad Pond is practically all developed.

Between the slack water above Oldtown dam and the outlet of Olamon Stream, a distance of 13.25 miles, the difference in elevation is but 12 feet. The river is wide, contains many islands, and is bordered by much low land. Power sites are practically lacking. From Olamon Stream to a crib dam (used to divert logs) at the head of Passadumkeag Rapids, a distance of 5.25 miles, the banks become higher, the river is narrower, and although islands are still numerous, they are much smaller. In this stretch there is a gradual fall of nearly 17 feet. Between the head of Passadumkeag Rapids and the foot of West Enfield dam, a distance of 5.95 miles, the difference in elevation is only 3 feet. The West Enfield dam gives a head of 19 to 21 feet. In the 5.7 miles between the dam and the foot of Mohawk Rapids the fall is but 2 feet.

The foot of Mohawk Rapids is at elevation 154 feet above sea level. If a 16-foot dam should be constructed there, the slack-water limit would reach the lower end of Brown Islands, 16 miles up river. Only a small area of lateral land would be submerged, although some damage would be created at Lincoln. The minimum flow with present storage at Mohawk Rapids is about 3,400 second-feet. Maximum primary development over the 16-foot dam would be equivalent to about 4,700 horsepower; with increased storage as suggested in the table on page 208 the primary power would be about 5,700 horsepower.

Between the foot of Five Island Rapids and the mouth of Mattawamkeag River, a distance of 2.3 miles, the fall is about 11 feet. A dam constructed on Five Islands Rapids, with its crest at elevation 200 feet above sea level, would control a head of about 25 feet. The pondage would extend about 2¾ miles up Mattawamkeag River, flood ing out a part of Stratton Rips but apparently causing little damage to the town of Mattawamkeag. The roadbed of the Maine Central Railroad would, however, be somewhat damaged, and perhaps also the Canadian Pacific Railway bridge across the main river. The backwater would extend up the main river about 6½ miles from the dam site, perhaps causing some damage at Jordan Mills. The available primary power developed over a head of 25 feet is about 7,700 horsepower; that available under increased storage is 9,100 horsepower.

Another plan would be to build a dam near Jordan Mills, 4.4 miles from Five Island Rapids. A dam constructed here to elevation 220 feet above sea level would afford a head of 31 feet, and the 220-foot contour would intersect the present water surface 5 miles up river, between Salmon Stream Rapids and Joe Mary Rapids. Apparently the pondage would cause little damage except in places to the highway.

In the 5.8 miles between this point and the head of Burnt Land Rips the fall is 40 feet. The East Branch joins the main river about 1½ miles below the rips at Medway. A part of this fall could probably be developed by a dam near the head of the Joe Mary Rapids, but the pondage created by a high dam would cause damage at Medway on the East Branch, a rise of 25 feet at the mouth backing the water upstream over 7 miles.

Between Burnt Land Rips and Shad Pond, a distance of about 6½ miles, the fall is about 83 feet, of which 75 feet is developed. From Shad Pond to Quakish Lake, a distance of about 4 miles, the fall is more than 90 feet, all included in the development at Millinocket. (See p. 142.)

WEST BRANCH OF PENOBSCOT RIVER ABOVE AMBEJEJUS LAKE.

The valley of the West Branch of Penobscot River from Twin Lakes to Chesuncook Lake is rugged and picturesque. The total fall in this distance of 25 miles, measured from the sill of the deep gates of Chesuncook dam to the elevation of the sill of the deep gates of North Twin dam, is 444 feet. Chesuncook dam will hold a head of about 22 feet, and the level of the lower lakes may be raised 25 feet by North Twin dam. Of this 444 feet, 310 feet occurs in the first 10 miles, and 240 in the first 5½ miles below Chesuncook dam. A number of abrupt falls occur in this stretch of river. The following table gives the name, location, elevation, and differences of elevation of the several falls:

Distances and elevations along West Branch of Penobscot River from Ambejejus Lake to Chesuncook Lake.

[Elevation of Ambejejus Lake above sea level, 465 to 490 feet.]

Locality.	Distance from lake.	Distance between points.	Elevation above sea level.	Difference in elevation.
	Miles.	*Miles.*	*Feet.*	*Feet.*
Ambejejus Falls: Foot	0.00		[a] 478	
Head	0.40	0.40	488	10
Passagormuc Falls: Foot	1.87	1.47	488	00
Head	2.10	.23	498	10
Debsconeag Falls: Foot	5.35	3.25	499	1
Head	5.60	.25	527	28
Pockwockomus Falls: Foot	8.50	2.90	528	1
Head	8.95	.45	549	21
Abol Falls: Foot	9.65	.70	551	2
Head	10.15	.50	564	13
Sourdnahunk Falls: Foot	13.30	3.15	573	9
Head	13.70	.40	[b] 598	25
Big Ambejamackamus Falls: Foot	16.98	3.28	624	26
Head	17.65	.67	653	29
Big Eddy	19.60	1.95	668	15
Sill Ripogenus dam, foot of lake	22.00	2.40	882	214
Head of Ripogenus Lake (mean low-water surface)	24.53	2.53	883	1
Sill of Chesuncook dam	25.10	.57	909	26

[a] The elevation of Ambejejus Lake is controlled by North Twin dam. Elevation of deep gates = 465 Elevation of flashboards = 490. Mean = 478.

[b] The elevation of the water surface above Sourdnahunk Falls is controlled by the dam at head of main pitch. Elevation of water surface at mean low water under natural conditions is about 590. Elevation of spillway of dam = 606. Mean = 598.

Ambejejus and Passamagormuc falls, the first two met in going up the river from Ambejejus Lake, are comparatively unimportant as power sites on account of the backwater from the Twin Lakes system. Ambejejus Falls have been submerged by the erection of Twin dam. With water at dam crest elevation (484.6 feet above sea level) only about 2 feet of the fall remains unsubmerged. The extreme flashboard elevation on these lakes is 489.62 feet. With flashboards raised submergence of these falls is complete and slack water extends up beyond the foot of Passamagormuc Falls. The elevation of the foot of Passamagormuc Falls is 488 feet above sea level. If additional storage should be provided for the Twin Lakes system, the 8-foot fall at Passamagormuc would also be largely submerged.

At Debsconeag Falls, about 5½ miles above the lower lakes, the river descends about 28 feet in one-fourth mile. The upper portion of the fall is over solid ledge, the lower over rocks and bowlders. The land is high on both sides, and affords an excellent dam site. The available head could easily be increased 5 feet. The distance to the next fall above is nearly 3 miles, and the river affords considerable natural pondage. A 5-foot vertical increase would create much more. A few sporting camps are located within this area, which would probably be damaged by any considerable rise, but otherwise the only damage would be to timber.

In the stretch between the head of Debsconeag and the foot of Pockwockomus falls the river is practically level, but at Pockwockomus it descends about 21 feet in one-half mile, making two pitches. The right bank is high, but the left slopes gradually. The locality affords a very good dam site, and but little pondage would be caused by raising the level of the water above the falls.

About 0.7 mile farther upstream, or 9.65 miles above the lower lakes, is Abol Falls. This fall is about one-half mile long and is composed of two pitches, the total descent being about 13 feet. The bed is rough, with many rocks and bowlders, and the banks are fairly high on both sides. Dam sites are available, though the conditions are not so favorable as at the two previous sites. The raising of the water surface to any great extent above the falls would create considerable pondage and would flood out numerous lagoons. Abol and Katahdin streams enter just above the head of Abol Falls, their waters coming from the vicinity of Mount Katahdin. Between this point and the foot of Sourdnahunk Falls, a distance of 2.75 miles, the current is stronger and there are occasional rips.

Sourdnahunk Falls is nearly 13 miles above the lower lakes, is about 0.4 mile long, and makes a natural descent of about 17 feet. At the head of the upper pitch is a log-driving dam, the spillway of which is at elevation 606 feet above sea level; as the elevation of the water surface at foot of lower pitch is 573 feet, the difference is 33 feet. The fall is crooked, rough, and rocky, the upper portion being over and through the solid ledge. The natural upper pitch is abrupt and about 9 feet high; it affords an excellent dam site between ledge abutments. The present dam forms a pond, called Sourdnahunk dead water, which stretches back 2.2 miles, and in places is of considerable width and depth.

From the head of Sourdnahunk dead water to the foot of Big Ambejamackamus Falls, 1 mile farther upstream, extends what is known as the Horserace. The elevation of the water surface at the head of the Horserace is 624 feet above sea level; the level of the foot is controlled by Sourdnahunk dead water, which, as previously explained, is in turn controlled by the dam below. The fall of 15 to 30 feet is over a rocky bed, between gradually sloping banks, and is distributed very evenly through the entire distance.

Immediately above the Horserace commences Big Ambejamackamus Falls. The elevation of the foot of the falls is 624 feet; that of the head is 653 feet above sea level; the fall is therefore 29 feet in 0.67 mile. Through most of this distance the stream flows over the solid ledge between high banks and is very crooked. The locality affords an excellent dam site.

Between Big Ambejamackamus and the Big Eddy, a distance of 1.95 miles, the fall is about 15 feet. It is made up of several pitches and considerable reaches of rapid water. In the 2.4 miles between the Big Eddy and Ripogenus dam, at the foot of Ripogenus Lake, the fall is 214 feet. In this stretch the river is a torrent, flowing through ledges with almost vertical sides, 40 to 75 feet high. In many places it is very narrow and affords excellent dam sites. The drainage area at the outlet of Ripogenus Lake is 1,410 square miles. Under natural conditions this should provide an extreme low-water flow of perhaps 400 second-feet, which would give, under a fall of 214 feet, nearly 10,000 gross horsepower. Under fully developed storage, as indicated on page 208, this could be increased to upward of 40,000 horsepower.

The difference in elevation between the mean low-water surface of Ripogenus Lake and the sill of the deep gates of Chesuncook dam is about 26 feet; the fall is made in about 0.57 mile, with most of it, however, in less than half this distance. The dam at the outlet of Chesuncook is a timber crib structure, about 1,500 feet long, and controls a head of about 22 feet; it is used for storage for log driving and power. This dam is 25.1 miles above the lower lakes.

From Chesuncook dam to the head of Chesuncook Lake the distance is about 16 miles, and that from the head of the lake to Seeboomook dam is 29 miles. The elevation of the water surface of Seeboomook dam, with gates open, is 1,041.5 feet above sea level. As the elevation of the water of Chesuncook Lake when full is 930.6 feet, the total fall in the 29 miles is 111 feet. Within 4½ miles from Chesuncook are Pine Stream Falls and Rocky Rips. The former is entirely and the latter partly submerged when the lake surface is at elevation 930.6 feet, the pondage under this condition extending 4.3 miles up the river. At ordinary stages Rocky Rips affords a fall of about 7 feet, but high water in the lake reduces it to about 2 feet. The head of Rocky Rips is 4.6 miles from the lake at elevation 932.6 feet. Between Rocky Rips and the foot of Fox Hole Rips, about 7 miles from Chesuncook, the fall is about 1.4 feet. The head of Fox Hole Rips is about 8.65 miles above the lake and is at elevation 952 feet (approximately), giving a fall of about 18 feet in a distance of 1.65 miles. The best dam site is probably just below the island near the head of the rips. At this point the elevation of the water surface is about 945 feet above sea level and a dam raising the water 20 feet, or to elevation 965 feet, would afford a total head of about 30 feet by means of a canal and penstock on the right bank. The 965-foot contour would meet the present water surface of the river at a distance of 25.25 miles from Chesuncook, forming a pond 17 miles long. This would do no especial harm in the vicinity of Joe Smith's Halfway House, as the banks at this place are quite high and his main buildings are situated at elevation about 980 feet. Such a pond would probably raise Lobster Lake slightly, the elevation of the river at Lobster Stream inlet being about 962 feet above sea level. No data are available as to the width of this pond in the low stretch of river between the rips and a point some distance above Northeast Carry, but it would undoubtedly be considerable. The natural stretch of slack water ends about 4.65 miles above Northeast Carry, or 24.9 miles from Chesuncook.

In the 1½ miles between Northeast Carry and the foot of the Roll dam the fall is about 14 feet. The elevation of the top of the Roll dam is 985 feet and the fall is about 9 feet. In the next three-quarters of a mile above, the fall is 27 feet, the shores are fairly steep, and the bed rough and rocky. This 27-foot fall may be said to constitute the lower pitch of Seeboomook Falls; another pitch of about 4 feet is made 28 miles from Chesuncook, but the upper pitch is located 28.9 miles from the lake, or about 2½ miles above the Roll dam, the foot of this pitch being at elevation 1,019 feet above sea level. The water surface above the dam at this point, when the gates are open, is at elevation 1,041.5, giving a fall of 22½ feet; the elevation of the crest of the dam is at 1,050.6. This dam is of rough timber construction and is used for log driving.

EAST BRANCH OF PENOBSCOT RIVER.

MEDWAY TO GRAND LAKE.

The East Branch differs from the West Branch in having a steadier fall and fewer abrupt pitches, and it is therefore less attractive for power development than the West Branch.

The adjacent country, like that bordering the West Branch, is largely timber and wild land, and power can be developed without damage to property.

Between Medway, at the mouth of the East Branch, and Grand Lake, about 47.5 miles, the fall is 408 feet, it is wholly undeveloped, and is quite evenly distributed.

The following table gives the name, location, elevation, and differences of elevation of the falls between Medway and Grand Lake:

Falls on East Branch of Penobscot River between Medway and Grand Lake.

Locality.	Distance above Medway.	Distance between points.	Elevation above sea level.	Difference in elevation.
	Miles.	*Miles.*	*Feet.*	*Feet.*
Medway	0.0		233	
Ledge Falls: Foot	2.1	2.1	241	8
Head	2.4	.3	247	6
Rocky Rips: Foot	7.1	4.7	258	11
Head	7.4	.3	265	7
Grindstone Falls: Foot	8.3	.9	271	6
Head	9.4	1.1	301	30
Crowfoot Falls: Foot	11.2	1.8	301	0
Head	11.3	.1	303	2
Whetstone Falls: Foot	20.5	9.2	330	27
Head	20.9	.4	341	11
Matagamon House	22.6	1.7	342	1
Wessataquoik Stream	23.5	.9	345	3
East Branch crossing	24.3	.8	347	2
Little Seboeis River	24.8	.5	347	0
Seboeis River	26.8	2.0	348	1
Lower Monument line	27.7	.9	351	3
Little Spring Brook	33.7	6.0	396	45
Big Spring Brook	36.1	2.4	425	29
The Grand Falls:				
Bowlin Pitch: Foot	37.1	1.0	433	8
Head	37.2	.1	438	5
Hulling Machine: Foot	38.1	.9	446	8
Head	38.3	.2	468	22
Grand Pitch: Foot	39.0	.7	482	14
Head	39.1	.1	501	19
Pond Pitch: Foot	39.7	.6	520	19
Head	39.8	.1	531	11
Haskell Rock Pitch: Foot	40.1	.3	537	6
Head	40.8	.7	580	43
Stair Falls: Foot	41.7	.9	587	7
Head	42.5	.8	605	18
Sill of Grand Lake dam	47.5	5.0	641.2	36.2

In the 2.1 miles between Medway and Ledge Falls the fall is about 8 feet, the most of this occurring in the upper half of the distance. At Ledge Falls the river makes a descent of 6 feet in 0.3 mile. About 1,000 feet from the mouth of the East Branch is an excellent dam site; a head of about 20 feet could be obtained at this point and the pondage would cause damage only to a newly constructed railroad and to farming lands.

At Ledge Falls a dam 700 to 1,000 feet long would afford a head of about 20 feet; the pond would extend about 5 miles up river, would damage farming lands, and in places would overflow the highway.

Ledge Falls is about 5.9 miles below the foot of Grindstone Falls, which is 8.3 miles above Medway. At Grindstone the river makes a descent of 30 feet in a distance of 1.1 miles, the head of the falls being located only a short distance below the Bangor & Aroostook Railroad bridge. Grindstone Falls probably affords the best power site on the East Branch, taking into consideration the available head, flow, and proximity to the railroad. Near the foot of the upper pitch is an excellent site for dam about 800 feet long between solid ledge abutments and very high banks. The fall is, for the most part, over ledge, the stratification planes of which are almost perpendicular to the current. The head might possibly be increased 8 to 10 feet without creating much damage; an increase of about 20 feet, however, would submerge most of the buildings near the railroad station, and would require raising the railroad track several feet. The regular gaging station of the United States Geological Survey is located at this bridge, the drainage area at this point being 1,100 square miles.

Between the head of Grindstone Falls and the foot of Whetstone Falls, a distance of 11.2 miles, the fall is about 29 feet. At Whetstone Falls a descent of 11 feet in 0.4 mile is made in two pitches with a short stretch of slack water between. The bed is rough and is similar to that at Grindstone Falls. The shores are ledgy, with comparatively low banks, and little increase in head over the natural fall could be gained by constructing a dam. On the whole this power site is not attractive.

From the head of Whetstone Falls to a point about one-half mile below the mouth of Wessataquoik River, a distance of 2 miles, the land is very low. Above this point the banks are higher, especially the left, up to Seboeis River, where low land again begins, the fall in about 6 miles being 6½ feet. This low stretch continues to and above "Monument Line," about 1 mile above Seboeis River, where a large expanse of meadow is entirely under water during the spring freshets. In the 9.4 miles between Monument Line and the foot of Bowlin Falls the fall is about 82 feet, or nearly 9 feet per mile, rather uniformly distributed. In this stretch the stream flows over gravel and bowlders and between comparatively low banks; not more than from 10 to 15 feet of the fall could be utilized at any one point and there would be much overflowed land. A dam about three-quarters of a mile below the "Devils Hole" would afford from 12 to 15 feet head, and would back the water about 1¼ miles upstream. The dam would probably need to be at least 1,000 feet long to obtain this head.

A head of 15 to 20 feet could be obtained by building a 600-foot dam about 0.9 mile below the Hatchery, but with a head of 20 feet the water would flow out the Hatchery and would meet the present water surface 1.3 miles above; the only other damage done would be to standing timber and would probably be small.

Bowlin Falls, the lowest pitch of the Grand Falls, is 37.1 miles above Medway; the fall is 5 feet in 0.1 mile. A dam built about 1,500 feet below the falls could obtain a head of 20 feet; the pond would flood the lower pitch of the "Hulling Machine," but would cause little damage. The banks are in general high, the shores are rough and rocky, with ledge outcropping in many places, and several excellent sites for a dam 300 to 400 feet long are available.

The foot of Hulling Machine is 0.9 mile above the head of Bowlin Falls. The river takes a crooked course between precipitous ledge banks, and the fall is about 22 feet in 0.2 mile. The locality affords many excellent dam sites, and a head of 25 feet is obtainable without difficulty. By building a dam near the head of the Hulling Machine and using a penstock below, 35 to 40 feet head could be utilized. Under the latter conditions the dam would be about 400 feet long, with a wing for a short distance on the left bank. Backwater would extend nearly to the foot of Grand Pitch, a distance of 0.6 mile. The banks are so high throughout this distance that no pond of any considerable width would be created.

At Grand Pitch, 39 miles above Medway, and 0.7 mile above the head of Hulling Machine, the river makes an almost sheer drop through the solid ledge, descending about 19 feet in a distance of about 500 feet. A 28 to 30 foot fall could be obtained by building a dam at this point; the backwater would extend about 1,800 feet upstream and would cause little overflow. The cost of construction would probably be less here than at any other site on the river.

Haskell Rock Pitch, 1 mile above the head of Grand Pitch, is composed of two separate falls, with slack water between; the total fall is 43 feet in 0.7 mile. The upper pitch—about 36 feet in a distance of about 1,900 feet—is made through a solid ledge; the lower 7 feet, in a distance of about 1,500 feet, through banks composed of rocks and earth. The water boils through this fall over rocks and bowlders, the banks being rather low. Probably not more than the natural fall could be readily developed, and that only by placing a dam near the head of the first pitch and using a penstock below. The country above is wide and swampy, any rise in the natural water surface flooding large areas. Under a 5-foot rise the pondage would extend back very nearly to the foot of Stair Falls.

Stair Falls, the last pitch of the Grand Falls, is located 41.7 miles from Medway, and 0.9 mile from the head of Haskell Rock. Throughout its length the fall is made over the same peculiar ledge formation observed at Grindstone. The total fall is about 18 feet in a distance of 0.8 mile. The shores are low for the entire distance and good dam sites are lacking.

A short distance above Stair Falls the river is very crooked, flowing through a very low country; the fall for about 3 miles is about 7 feet. In the 5 miles between the head of Stair Falls and the sill of the gates of Grand Lake dam the total fall is about 36 feet. Of this amount 16 feet occurs in the first one-half mile below the dam, and 18 feet in the first mile. The head held by the present dam, which is used entirely for log driving, is about 14 feet. A dam 200 to 300 feet long and of any reasonable height could be built at this point between ledge abutments, except for several small channels now closed by cribwork and piling. The present dam, although founded between excellent ledge abutments, is a rather frail timber-crib structure about 185 feet long, having 5 gates 8 feet wide and 1 sluice gate 17 feet wide.

WEBSTER BROOK AND EAST BRANCH OF PENOBSCOT RIVER.

As previously stated, Webster Brook has now become the connecting link between the East Branch and its main headwaters. The distance from Telos dam to the head of Second Lake is 12.5 miles, and the fall in this distance is 294.2 feet, measured from the sill of the gates of Telos to the sill of Grand Lake dam, the latter holding a head of 14 feet and the former a head of 13 feet, of which only 10 feet can be used.

Webster Brook and East Branch unite a short distance from the head of Second Grand Lake, the distance of Third Lake from the point of junction being about 5.9 miles, and the fall in this distance being about 95 feet.

In the lower part of its course Webster Brook flows over a gravel bed, which soon becomes rough and rocky, and one-half mile above its mouth its elevation is 678 feet above sea level, or 37 feet higher than the elevation of the sill of Grand Lake dam. From this point to a point about 250 feet above Grand Pitch the distance is about 0.1 mile and the fall is 35 feet, of which 16 feet is made at Grand Pitch in a nearly sheer drop and 7 feet in the 250 feet above the falls. From the head of Grand Pitch to the dam at Indian Pitch is about 2.1 miles, and the fall is this distance, measured from the sill of the dam, is about 62 feet. This dam is built of logs, is about 75 feet long, is controlled by two 12-foot gates, and will hold a head of about 8 feet. It is used simply for "flushing," is about 3 years old, and is in good repair.

In the 6 miles between Indian Pitch and Webster Lake the fall is about 116 feet, considered from the sill of Webster dam to that of Indian Pitch dam.

Webster Lake is 3 miles long, the remaining fall of 44 feet being in the 0.9 mile from its head to the sill of Telos dam. This distance is rough and rocky, with high banks and shores on each side. Throughout its entire course the brook is for the most part a boiling torrent, although there are stretches where the current is simply strong and short stretches of slack water. The banks are low first on one side and then on the other, although as a rule they hold good. Many excellent dam sites are found along this stream from Second Grand Lake to Telos, and although surveys were not made to determine the topography, it is probable that heads of 15 to 40 feet could be developed. The drainage area at the mouth of Webster Brook comprises only about 295 square miles, although excellent storage facilities exist above.

Between the sill of Grand Lake and that of the dam located at the outlet of Third Lake on East Branch the fall is about 110 feet, the elevation of the latter sill being about 751 feet above sea level. The fall is fairly uniform, with some abrupt pitches, and strong water separated by stretches of dead water. About 0.8 mile above the mouth is an old dam, the elevation of the water surface just above being 671 feet above sea level, or 30 feet above the elevation of the sill of Grand Lake dam. There is a fall here of about 7 feet. About 0.4 mile farther upstream is a fall of about 3 feet, at the foot of about a mile of dead water. Bog Brook comes in on the left bank about 3.1 miles from mouth; at this point there is a 4-foot fall, the elevation of water surface above being about 690 feet above sea level. Brayley Brook enters on the right bank 4.3 miles from mouth, the elevation of the water surface here being about 705 feet above sea level. Between the mouth of Brayley Brook and the outlet of Third Lake the fall is nearly uniform, the amount being about 46 feet in the remaining 1.6 miles. The timber crib dam at the outlet, used for log driving, is 225 feet long, holds 9.7 feet head, and is in good condition; it is about 5 years old. Owing to low land in the vicinity of the dam, it is probable that not much more head could be held than at present.

The following table shows the relative elevations of each stream:

Elevations along Webster Brook and East Branch of Penobscot River.

Webster Brook.

Locality.	Distance.	Elevation.
	Miles.	*Feet.*
Water surface at junction of two streams	0	657
Foot of Roll dam	.5	678
Head of Roll dam (250 feet farther up)		690
Head of Grand Pitch	.6	706
250 feet above Grand Pitch		713
Sill of Indian Pitch dam	2.7	775
Crest of Indian Pitch dam	2.7	683
Sill of Webster Lake dam	8.7	891
Sill of Telos Lake dam	12.5	935.4

East Branch of Penobscot River.

Water surface at junction	0	657
Old dam	.8	
500 feet below		664
Just above		671
Falls	1.2	674
Head of dead water	2.2	674
Bog Brook	3.1	690
Brayley Brook	4.3	705
Sill of Third Lake dam	5.9	751

MATTAWAMKEAG RIVER.

The Mattawamkeag, which joins the Penobscot at the town of Mattawamkeag, 62.25 miles above Bangor dam, drains an area comprising 1,500 square miles. Though the available fall on the Mattawamkeag is not so large as on the tributaries previously discussed, much of it is capable of economic development, and it is all within easy reach of the Maine Central Railroad.

Between the mouth of the Mattawamkeag River and the mouth of Baskahegan Stream the distance is about 35 miles and the total fall is 150 feet. Dead water occurs in only two places, but one of these is more than 11 miles long; in the other part of the course the current is swift and in some places rapids are formed.

For the purpose of this general discussion the river will be divided into five stretches:

1. From Penobscot River to the mouth of Carlisle Brook, which is located near the Mattawamkeag-Kingman town line; this stretch is 8 miles long and the total fall is 108.5 feet, two-thirds of which occurs in about 2 miles. This is the largest proportionate fall on the river. The shores in general are of gravel or ledge, rise high above the river, and are wooded most of the way.
2. From the mouth of Carlisle Brook to the canoe landing at Kingman village. This stretch is 3.1 miles long and is known as Kingman deadwater. Quick water begins just above the canoe landing. The river banks are low and wooded and the country is more or less swampy in the vicinity of the river.
3. Between the foot of the swift water at Kingman village and Grants Mills, the distance is 2 miles, and the fall is 19.3 feet. The banks are fairly high nearly to Grants Mills, where they are rather low. The shores are wooded on the left bank and open on the right; they are composed of gravel, with many large bowlders.
4. Between Grants Mills and the Wytopitlock highway bridge is a stretch known as the Drew dead water; it is 11.2 miles long, and in this distance the total fall is only 0.2 feet. The shores are low and wooded. The surrounding country is low and swampy, especially in the vicinity of Mud Lake and the Oxbow.
5. Between Wytopitlock highway bridge and the mouth of Baskhegan Stream at North Bancroft, a distance of 9.6 miles, the fall is 22 feet. The banks are in most places high, especially where the greatest fall occurs. Some areas are under cultivation, but most of the country is wooded.

The first well-defined rapids on the river occur at Stratton Rips, about 1½ miles above the Maine Central Railroad bridge at Mattawamkeag. Below this point there is a fall of 8 feet to the junction of the Mattawamkeag with the main river—not enough to be of value for development. Beginning with Stratton Rips, there are, in the next 2½ miles above, a number of important falls. At Stratton Rips the river falls 4 feet in a distance of 1,500 feet. Both banks are high at this point. Ledge exists for several hundred feet along the right bank, outcropping to a height of 20 feet above the river, and doubtless underlies the high land farther back from the river. The right bank is of gravel, rises steeply, and is wooded. The water surface has an elevation of 197 feet above sea level where the ledge occurs; not over 400 feet from either bank, the elevation is 250 feet above sea level.

At Ledge Falls, 1¾ miles above Stratton Rips, the stream makes a descent of 3 feet in a distance of 300 feet. On both banks are ledges, those on the left being about 10 feet high and those on the right bank higher. The banks are steep back of the ledges.

Less than one-half mile above Ledge Falls are the largest falls on the river. Here the river makes two distinct pitches about 700 feet apart, called Lower and Upper Gordon Falls. At the lower pitch the fall is 6 feet in a distance of 500 feet; at the upper the fall is 13 feet in a distance of 700 feet. Both banks consist of ledge, which shows for a distance of 10 feet above the river. Back of this ledge the right bank rises very steeply, but on the left the rise is more gradual.

From the head of Upper Gordon Falls to the foot of Stratton Rips there is a total fall of 48 feet, all occurring in a distance of about 2½ miles. The banks are high through the entire distance, except near the mouth of Mattakeunk Brook, which drains an area that rises rapidly back from the Mattawamkeag. Dams that would provide a good head could be built at any of the places mentioned. It would be feasible to construct a dam at Stratton Rips, flooding back to the foot of Lower Gordon Falls and giving a head of about 24 feet, and a second dam at Lower Gordon Falls flooding out Upper Gordon Falls, giving an additional 24-foot head. Or it would be entirely feasible to erect the dam at Stratton Rips, which would flood out Upper Gordon Falls and give a head of about 50 feet. Either of these dams would aid materially in log driving by making slack water over a portion of the river which is now difficult to drive. Formerly some sort of a structure existed at Lower Gordon Falls, designed to flood out the rocks, but only the shore ends of the structure now remain.

About 1 mile above upper Gordon Falls is the beginning of a stretch of very quick water. The lower end of this stretch is called Slewgundy, and the upper part Scatterack. The total length is about 1½ miles, and the total fall in this distance is 40 feet. The bed is very rough and the banks are ledges, in some places 50 feet high. The river is about 200 feet wide in the Slewgundy. All or nearly all of this fall could be developed by a dam built near the lower end.

One mile above the Scatterack is Rams Head Falls, which is made up of two short stretches of quick water about 1,000 feet apart. At the lower stretch the fall is 5 feet in 1,000 feet, at the upper the fall is 2 feet in 100 feet. Kingman deadwater begins at this point. A dam built at the foot of the quick water just above Scatterack would provide a head of about 10 feet; it would flood out Kingman deadwater to some extent.

The current is swift from Kingman village to Grants Mills, and in two places there is a decided pitch. One is at Kingman highway bridge, where there is a fall of 3 feet in 500 feet, and the other at the head of the quick water, near an island just below Grants Mills, where a fall of 8 feet occurs in a distance of 1,800 feet. The right bank is high and steep all the way; the left bank rises gradually to a height of 20 to 30 feet above the river within a few hundred feet from the shore.

Mills at Kingman formerly utilized part of the power, but they have long since been burned, and nothing remains but the crib wing walls on each side. At the site of this old dam both the banks are steep, and ledge outcrops on the left. The site could be utilized for a dam designed to flood out the falls up to the slack water at Grants Mills and obtain a head of about 15 feet. Under these conditions the water surface would be about 5 feet below the Kingman Bridge. Probably the Drew deadwater could not be flooded out to any extent, as the land is low on both sides of the river, and, although data are not at hand to verify the statement, such flowage would doubtless cause much damage.

No decided falls occur in the upper section of the river, but at a number of places the river falls about a foot or two in a short distance. The most favorable dam site is at the village of Bancroft. The current is swift from the Maine Central Railroad bridge down to a point near the Reed-Bancroft town line, a distance of about 1,500 feet. The banks are extremely high and are of shale ledge. The river is narrow, and it would be possible to develop from 10 to 15 feet head, as in most places the shores are either steep or rise gradually from the river.

The following table shows distances from the mouth and elevations of controlling features along the Mattawamkeag River:

Distances and elevations along Mattawamkeag River.

Locality.	Distance from mouth.	Distance between points.	Elevation above sea level.	Difference in elevation
	Miles.	*Miles.*	*Feet.*	*Feet.*
Mouth	0	....	187	....
United States Geological Survey gage zero, Michigan Central Railroad bridge	0.6	0.6	186	−1
Stratton Rips: Foot	2.1	1.5	195	9
Head	2.5	.4	199	4
Mattakeunk Brook	3.4	.9	210	11
Ledge Falls: Foot	3.85	.45	215	5
Head	3.90	.05	218	3
Gordon Lower Falls: Foot	4.3	.4	221	3
Head	4.4	.1	227	6
Gordon Upper Falls: Foot	4.5	.1	229	2
Head	4.7	.2	242	13
Little Gordon Brook	4.9	.2	243	1
Gordon Brook	5.2	.3	244	1
Slewgundy: Foot	5.6	.4	247	3
Head	6.3	.7	271	24
Scatterack: Foot	7.2	.9	280	9
Head	7.3	.1	287	7
Whitton Brook	8.1	.8	288	1
Rams Head Falls: Foot	8.2	.1	288	0
Head	8.4	.2	293	5
Carlisle Brook	8.9	.5	295	2
Sly Pond Outlet	10.1	1.2	295	0
Molunkus Stream	10.4	.3	295	0
Old dam at Kingman	12.2	1.8	299	4
Kingman Bridge Rips: Foot	12.5	.3	301	2
Head	12.6	.1	304	3
Rips: Foot	13.1	.5	307	3
Head	13.5	.4	314	7
Grants Mills	13.8	.3	314	0
Cross Honey Brook	13.9	.1	314	0
Mattagoneas Brook	14.2	.3	314	0
Spragues Mill	15.3	1.1	314	0
Mud Brook	16.3	1.0	314	0
Oxbow	17.4	1.1	314	0
Big Meadow Brook	19.1	1.7	314	0
Jenkins Cove	19.5	.4	314	0
Libby Meadow Brook	20.5	1.0	314	0
Wytopitlock Stream	23.3	2.8	315	1
Do	25.3	2.0	315	0
Flinn Brook	25.6	.3	315	0
Hawkins Brook	26.6	1.0	316	1
Bog Brook	27.7	1.1	318	2
Woodchuck Island	28.1	.4	320	2
Bancroft, Michigan Central Railroad bridge	29.1	1.0	325	5
Smith Brook	29.6	.5	328	3
Seths Islands: Foot	30.0	.4	330	2
Head	30.5	.5	333	3
Baskahegan Stream, mouth	33.2	2.7	337	4

PISCATAQUIS RIVER.

Data relating to undeveloped water-power sites on Piscataquis River were obtained by a quick reconnaissance trip and from a study of the plane table sheets of the 1910 survey. The territory covered extends from the mouth of the river at Howland to a point within 2 miles of Blanchard, a distance of 59.8 miles. In this distance the total fall is 398 feet, of which only 92 feet have been developed.

The elevation of the river at its mouth is 127 feet above sea level; the top of the dam of the Howland Pulp & Paper Co. is 140 feet above sea level, and the pondage extends nearly 2 miles upstream. Seboeis

Stream enters on the left side 2.4 miles above the mouth, and the elevation of the water surface here is 142 feet. At Swallowtail Island, 4 miles from the mouth, the elevation of the water surface is 146 feet above sea level. Seven miles from the mouth, at the entrance of Hardy Brook or the foot of the McIntosh Rips, the elevation is 161 feet above sea level.

At McIntosh Rips the river falls 6 feet in 0.3 mile, and in 0.5 mile drops 8 feet. At the mouth of Roberts Run, a mile farther upstream, the elevation of the water surface is 175 feet above sea level; and 0.3 mile above Roberts Run is the foot of Clapps Rips which continue upstream for just 1 mile; the fall through the rips is 14 feet.

At the foot of Schootarza Rips, 10.3 miles above the mouth of the river, the elevation is 194 feet above sea level; in the 0.7 mile up to the mouth of Schootarza Stream the fall is 16 feet, of which 3 feet is concentrated at the falls in a distance of 500 feet. A series of falls and rips, known as Schoodic Falls extend from this point up to the mouth of Schoodic Stream 12.3 miles from the mouth, where the elevation is 228 feet above sea level. The banks of the river are high throughout this stretch and for some distance above the mouth of Schoodic Stream. It is probable that a dam of any reasonable height could be constructed 1 to 1½ miles below the mouth of Schoodic Stream. Some ledge appears, but for the most part the banks appear to be gravel and loam. The river at this point is perhaps 300 feet wide and the site is probably the best remaining undeveloped on the river.

At Campbells Rips, 15.7 miles above the mouth of the river, a fall of 5 feet is made in 0.1 mile. In the 2.3 miles between the rips and Upper Ferry, where the elevation is 257 feet above sea level, the slope is comparatively gradual, and the total fall is 8 feet. In the next stretch of 4.5 miles, or to within 0.2 mile of the mouth of Sebec River, the Piscataquis is practically ponded, as the fall is only 1 foot in this distance. Immediately above the mouth of Sebec River, a 5-foot fall is made by rips in a distance of 0.2 mile.

Between this point and the foot of the dam of the Dover & Foxcroft Light & Heat Co., 36.7 miles from the mouth, where the Bangor & Aroostook Railroad crosses the Piscataquis, and in the next stretch above, or to the foot of the rips about one-half mile below Foxcroft, the slope of the river is gradual. At the rips the river drops 6 feet in a distance of 0.3 mile, but not much backwater could be created, on account of the dam of the American Woolen Co., immediately above.

Just above the mouth of Salmon Stream a fall of 2 feet occurs in about 400 feet. The river is practically all developed as far as Abbot village, where the elevation of the top of the dam is 421 feet. The distance from the mouth of the river to this place is 54 miles.

In the next 5.8 miles above to the head of Barrows Falls, about 2 miles below Blanchard, the fall is 104 feet. The entire stretch is a succession of rips and quick water.

The following table gives the distances and elevations of the several controlling points along the main river.

Elevations along Piscataquis River.

Locality.	Distance from mouth.	Distance between points.	Elevation above sea level.	Difference in elevation.
	Miles.	*Miles.*	*Feet.*	*Feet.*
Mouth of river	0		127	
Top of dam of Howland Pulp & Paper Co	.1	0.1	140	13
Mouth of Seboois Stream	2.4	2.3	142	2
Swallowtail Island	4.0	1.6	146	4
Hardy Brook: Foot of McIntosh Rips	7.0	3.0	161	15
Head of McIntosh Rips	7.5	.5	169	8
Roberts Run	8.5	1.0	175	6
Clapps Rips: Foot	8.8	.3	177	2
Head	9.8	1.0	191	14
Schootarza Rips: Foot	10.3	.5	194	3
Head	11.0	.7	210	16
Schootarza Stream	11.0	0	210	0
Schoodic Falls, head	12.2	1.2	228	18
Schoodic Stream, mouth	12.3	.1	228	0
Little Schoodic Stream, mouth	14.1	1.8	234	6
Campbells Rips: Foot	15.7	1.6	244	10
Head	15.8	.1	249	5
Alder Brook, mouth	17.1	1.3	253	4
Upper Ferry	18.0	.9	257	4
Pleasant River, mouth	19.1	1.1	257	0
Sebec River, mouth	22.7	3.6	259	2
Rips	22.9	.2	264	5
Dover & Foxcroft Light & Heat Co., dam: Foot	36.7	13.8	283.8	19.8
Top	36.7	0	295.3	11.5
Rips	39.1	2.4	297	1.7
Rips	39.4	.3	303	6
American Woolen Co., Dover, dam: Foot	39.7	.3	305	2
Top	39.7	0	327	22.0
Mayo & Son, dam: Foot	40.2	.5	327	0
Top	40.2	0	339	12.0
Dover & Foxcroft Water Co., dam: Foot	41.8	1.6	342	3.0
Top	41.8	0	353.5	11.5
Salmon Stream, mouth	43.7	1.9	357	3.5
Salmon Rips, head	43.8	.1	359	2.0
Guilford Dam: Foot	48.7	4.9	372	13.0
Top	48.7	0	382	10.0
South Branch or Kingsbury Stream, mouth	51.9	3.2	385	3.0
Abbot village bridge	52.7	.8	390	5
Upper Abbot Dam: Foot	54.0	1.3	408	18
Top	54.0	0	421	13
Barrow Falls, head	59.8	5.8	525	104

SEBEC RIVER.

On Sebec River two power sites are undeveloped. At Sebec Falls, 6.2 miles from the mouth, a fall of 10 feet is made in a distance of 0.3 mile. Immediately below the dam at the outlet of Sebec Lake are undeveloped rips, through which the fall is 9 feet in a distance of about 700 feet. By the construction of a dam at Sebec Falls, flooding to an elevation of 316 feet above sea level or to the foot of the present dam at the outlet of the lake, a head of 36 feet can be obtained. This site is now held by parties contemplating power development, and detailed surveys of it have already been made. It should make a good project, as besides Sebec Lake there are a number of other important lakes in the drainage area above that can be utilized as storage reservoirs.

The following table shows distances and elevations at certain points on this stream:

Elevations along Sebec River.

Locality.	Distance from mouth.	Elevation above sea level.
	Miles.	*Feet.*
Mouth	0	259
Milo: Foot of dam	1.9	267
Top of dam	1.9	278.7
Sebec Falls: Foot	6.2	280
Top	6.5	290
Sebec village: Foot of dam	9.75	316
Top of dam	9.75	327.3

PLEASANT RIVER.

Pleasant River, an important tributary of the Piscataquis, rises in Bowdoin College grant immediately south of the Roach River drainage basin. The area contains a number of small lakes that could be utilized for storage reservoirs.

The elevation at the mouth of the river is 257 feet above sea level; 5.7 miles above the mouth is the foot of rips, the head of which is a short distance below Snows bridge. By these rips the river falls 4 feet in about 1,100 feet. From the rips to a point 7.8 miles above the mouth the slope is steep, then comes a 9-foot fall in a distance of 0.4 mile. The next important fall lies in the stretch between a point 9.5 miles above the mouth and the foot of the dam at Brownville; in this mile the fall is 12 feet. The Brownville dam backs water above the mouth of Whetstone Brook at a distance of 1.5 miles. A good dam site exists about halfway between Brownville and Brownville Junction, where a head of about 12 feet might be obtained, but a dam at this point would cause considerable pondage, as the land is somewhat low in the vicinity of Brownville Junction.

The foot of the next important fall is 0.8 mile above the mouth of the East Branch, where the river drops 10 feet in a distance of about 1,000 feet. The slope increases to an elevation of 390 feet above sea level at the junction of Roaring Brook, 17.7 miles from the mouth of Pleasant River, to elevation 434 feet at the junction of Houston Stream, 20 miles from the mouth. Houston Stream, in the 6½ miles from the outlet of Houston Pond to the mouth, has a fall of 388 feet. In the 3¾ miles between Houston Stream and the foot of the dam at the outlet of Silver Lake at the Katahdin Iron Works, the fall is 158 feet.

The following table gives the distances and elevations of the controlling points along this stream:

Elevations along Pleasant River.

Locality.	Distance above mouth.	Distance between points.	Elevation above sea level.	Difference in elevation.
	Miles.	*Miles.*	*Feet.*	*Feet.*
Mouth of river	0		257	
Snows Bridge Rips: Foot	5.9	5.9	267	10
Head	6.1	.2	271	4
Rips: Foot	7.8	.7	291	20
Head	8.2	.4	300	9
Foot	9.5	1.3	308	8
Brownville dam: Foot	10.5	1.0	320	12
Top	10.5	0	337	17
Bridge, Brownville Junction	13.7	3.2	343	6
East Branch, mouth	14.9	1.2	350	7
Falls: Foot	15.7	.8	362	12
Head	15.9	.2	372	10
Roaring Brook, mouth	17.7	1.8	390	18
Houston Stream, mouth	20.0	2.3	434	44
Houston Pond	26.5	6.5	822	388
Houston Pond Dam, top	26.5	0	830.3	8.3
Silver Lake Dam: Foot	23.75	3.75	588	154
Top	23.75	0	593.1	5.1
Silver Lake, water surface, September, 1910	23.75	0	592.3	—.8

PASSADUMKEAG RIVER.

Passadumkeag River receives the waters of Nicatous Lake and several brooks and ponds lying west of the St. Croix and Machias basins, the waters of the three systems lying in many places very near together; it unites with the Penobscot at the village of Passadumkeag, 5 miles below the mouth of the Piscataquis. Its length is about 35 miles. A short distance above its mouth it is joined by Cold Stream, which flows from Cold Stream Pond. The drainage area of the river at its mouth, including the 37 or 40 square miles tributary to Cold Stream, is not far from 350 square miles.

A dam at the outlet of Nicatous Lake, holding a head of about 8 feet, provides a means of flushing for log driving. From this point to Nicatous Falls, located about 2 miles farther down, the current is strong. At Nicatous Falls there is a drop of perhaps 10 or 15 feet in a distance of 1½ miles (see Pl. VII, *B*), and thence to the mouth of Pistol Brook the current is again strong. Dead water, caused by a dam located at Grand Falls near the point where the highway crosses the stream, extends up the main stream as far as Taylor Brook.

Surveys have not been made to determine the fall on Passadumkeag River, but the available information indicates that the drop at Grand Falls is about 25 feet in a distance of about 1 mile. These are practically the only falls worthy of note on the river, though between Grand Falls and the mouth slight falls and much quick water are found. Notable among these are White Horse Rips below Saponic Pond, Lightening Rips below Page's mill at Lowell, and Rocky Rips farther down.

Much of the country drained by the Passadumkeag is low and flat, and bogs and ponds are numerous. Dams are located at several of these ponds.

WATER STORAGE.

NATURAL FACILITIES.

The Penobscot basin affords excellent sites for water storage. The natural storage effected by ponds and lakes is large, the ratio of ponded area to total drainage area being about 1 to 21. In this respect the basin ranks next to the Kennebec, in which the ratio is 1 to 14. Though the Penobscot basin does not include any single natural reservoir as large as Moosehead Lake, it has many smaller lakes, like Chesuncook, Chamberlain, and the Twin Lakes system, which afford an enormous aggregate capacity.

The importance of utilizing stored water in an effective manner has not been as generally realized in the Penobscot basin as in the Kennebec, except on the West Branch of the Penobscot, where the Great Northern Paper Co. has, at its own expense, improved the storage facilities afforded by Chesuncook Lake and the Twin Lakes system. The log-driving companies on the Penobscot have not worked as harmoniously with power users as those on the Kennebec, and the result has been much waste of stored water.

Maps and plans of several lakes and ponds in the Penobscot drainage, surveyed by the United States Geological Survey in cooperation with the State Survey Commission and the State Water Storage Commission, are appended to this paper (Pls. XIII–XIX).

STORAGE ON WEST BRANCH OF PENOBSCOT RIVER.

GENERAL CONDITIONS.

The West Branch of the Penobscot is formed by the union of North and South branches and many brooks and small streams, nearly all rising in the mountainous country forming the western boundary between Maine and Quebec. Much of the area drained by these streams is timber country, and during the spring freshets various brooks and streams that are nearly dry for the remainder of the year are used to "drive" the logs into the main West Branch.

At the outlets of many of the ponds on the headwaters are timber crib dams, which hold back the water until it is needed to obtain a "flush" for driving logs. As a rule all of the stored water is required for the drive. After the drive is out of these streams the gates are usually left open so that during the remainder of the year the flow is natural. At Seboomook Falls, 29 miles from Chesuncook Lake, is a timber crib dam used only for log driving; the drainage area at this point is 530 square miles. Above this point the West Branch is a small stream; a short distance below it begins to widen.

Several streams, all of which drain small ponds, join the river between Seboomook Falls and Chesuncook Lake, the most important being Russell Brook, and Lobster and Pine streams. The largest of the ponds is Lobster Lake, which has an area of about 4 square miles. Between the head of Chesuncook Lake and the junction of West and East branches, a distance of about 69 miles, are two large natural storage basins in which lie Chesuncook and Ripogenus lakes, and the so-called "Lower Lakes" comprising North and South Twin, Pemadumcook and Ambejejus. Several other lakes about equal in area to South Twin Lake discharge their waters into the West Branch. The largest are Lower, Middle, and Upper Joe Mary, First, Second, and Third Debsconeag, Nahmakanta, Rainbow, Harrington, and Millinocket. The last named, although the largest of the detached lakes, is not available for storage in the Lower Lake system except at high water. (See p. 168.)

The storage on the West Branch is controlled by the West Branch Driving & Reservoir Dam Co., a corporation closely affiliated with the Great Northern Paper Co. Some of the dams hold water not only for power development but for a temporary "flush" for driving. At least two serve only for flushing, one located at the outlet of Ripogenus Lake, the other at Sourdnahunk Falls, 8.4 miles below.

TWIN LAKE SYSTEM.

Ambejejus and Pemadumcook lakes, and North and South Twin lakes, the first important lakes reached in traveling up the West Branch, are situated in townships Indian Nos. 3 and 4, T. 1, R. 9, T. 1, R. 10, and T. 2, R. 10. They form a natural reservoir, which the river enters at the head of Ambejejus Lake, and leaves at the foot of North Twin Lake. Their shore lines are very irregular, forming many points and coves, and their banks are commonly steep, although in many places low land borders the shores. They contain many islands. The water stands at the same level in all of the lakes except during low water, when the surface of Pemadumcook and Ambejejus is slightly higher than that of the Twin Lakes.

At the outlet of the system is a concrete dam in excellent condition. (See Pl. IX.) The lowest level of the lakes during the period of record occurred during April, 1906. The elevation of the water surface at that time was 466.75 feet above mean sea level, and the area of the water surface 17 square miles. The top of the flashboards of the dam is at elevation 489.6, at which height the area of the water surface is 24.6 square miles.

About a mile below North Twin dam the river widens out into Quakish Lake, which has an area of about 1 square mile. At the foot of this lake is a concrete dam used to divert the water of the West Branch through Ferguson Lake (which has been largely created by pondage) and thence through a canal about a mile long, into the penstock of the Great Northern Paper Co. at Millinocket. (See Pl. V.) After passing through the wheels the tail-race water flows into Millinocket Stream, and returns to the West Branch at Shad Pond. In this way the channel of the main West Branch between Quakish Lake and Shad Pond—a stretch about 4 miles long—is left nearly dry except during those periods when water is wasted over the dam at Millinocket. The drainage area above Quakish Lake dam comprises 1,880 square miles.

Millinocket Lake, situated principally in T. 1, R. 8, and T. 2, R. 8, lies northeast of Ambejejus Lake and at high water overflows into it. It is fed by several small streams, the principal one being Sandy Stream, which rises near Mount Katahdin. The natural outlet of Millinocket Lake is Millinocket Stream. At very high water, however, its water overflows into the Twin Lakes system. The area of Millinocket Lake is about 14 square miles.

When the surface of the Twin Lakes system reaches elevation 492 feet above sea level datum,[1] this being the top of the flashboards on the dam at the outlet, the water backs up for about 5½ miles above the head of Ambejejus Lake to Debsconeag Falls, filling numerous lagoons and flowing back into First Debsconeag Lake. Although this backwater covers a considerable area its value for storage is comparatively small, because the increase in depth of stored water is not large, owing to the falls at Ambejejus and Passamagormuc.

The dam at the outlet of North Twin Lake gives a head of about 25 feet (including 5 feet of flashboards) available for storage. It is probable that this head can be only slightly increased without a considerable outlay for "runarounds," etc.; and it is also probable that any great increase in head would result in flooding large areas, although the damage done would be restricted almost wholly to standing timber, as no important tracts of improved land lie within the flowed area.

The table following gives the area and capacity of the Twin Lakes system at different elevations.

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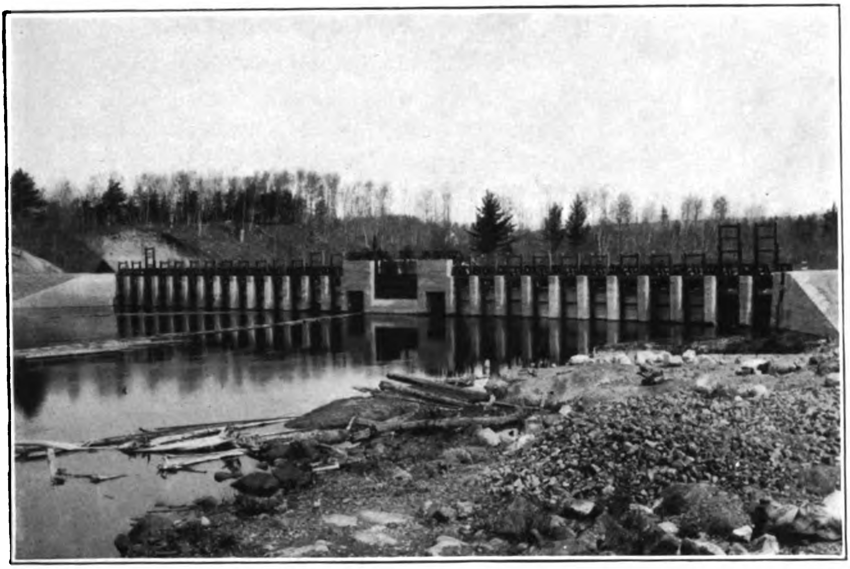
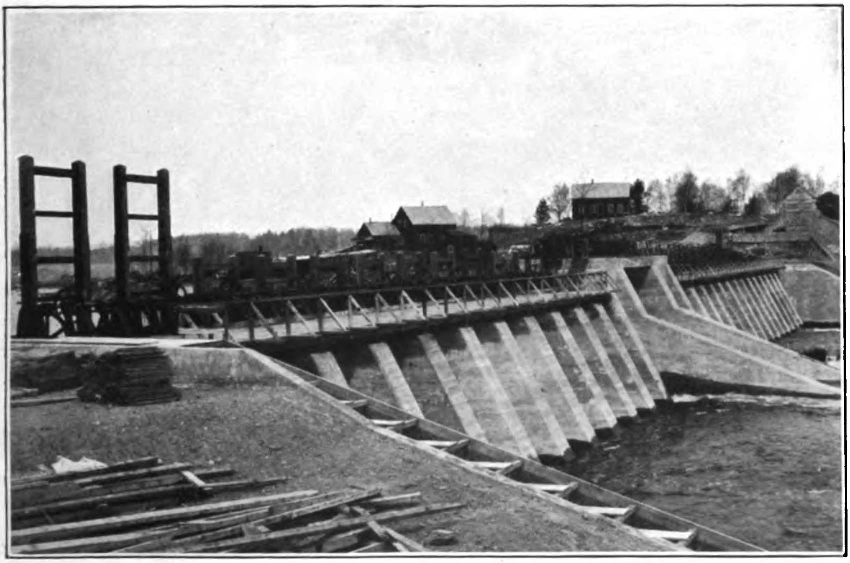
[1] See note in following table.



A. UPSTREAM SIDE.



B. DOWNSTREAM SIDE.

NORTH TWIN DAM AT OUTLET OF NORTH TWIN LAKE, WEST BRANCH OF PENOBSCOT RIVER.

Area and storage capacity above North Twin dam at different elevations.[a]

Elevation.	Area of water surface.	Capacity of section.	Total capacity above elevation 469 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
467				Bottom of deep gates.
469				
469.13	17.0		60,000,000	Lowest level of lake April, 1906.
471	17.0	950,000,000	950,000,000	
473	21.3	1,190,000,000	2,140,000,000	Bottom of shallow gates.
475	23.0	1,280,000,000	3,420,000,000	
477	23.0	1,280,000,000	4,700,000,000	
479	23.3	1,300,000,000	6,000,000,000	
481	24.0	1,340,000,000	7,340,000,000	
482	24.0		8,010,000,000	Bottom of log sluice.
483	24.0	1,340,000,000	8,680,000,000	
485	24.4	1,360,000,000	10,040,000,000	
487	24.6	1,370,000,000	11,410,000,000	Crest of spillway.
489	24.9	1,390,000,000	12,800,000,000	
491	24.9	1,390,000,000	14,190,000,000	
492	24.9		14,880,000,000	Highest level of lake (top of flashboards).

[a] Elevations refer to Bangor & Aroostook R. R. datum; to obtain mean sea level subtract 2.88 feet.

RIPOGENUS LAKE.

The first important lake above Ambejejus Lake is Ripogenus Lake, the outlet of which is 22 miles above Ambejejus Falls. This lake, which is more like an enlargement of the river than a lake, is about 2½ miles long and from one-half to three-quarters mile wide. Its banks are high except in the upper portion where Harrington Stream enters; here they are low and marshy for a considerable distance inland. The drainage area at the outlet of Ripogenus Lake is 1,410 square miles.

At the outlet of the lake is a timber crib dam, used principally to obtain a flush to carry logs through Ripogenus Gorge to the Big Eddy, a distance of 2.4 miles, in which the fall is 215 feet. The river here flows between high, almost perpendicular, ledge banks and is very narrow. The elevation of the sills of the gates is about 879 feet above sea level; the dam will hold a head of about 10 feet and is in fair condition. The area of the lake at elevation 883.3 feet above sea level is 1.07 square miles. At the crest of the dam, 889 feet above sea level, the area of the water surface is 1.27 square miles. The total capacity of the lake above the dam sills is 301,100,000 cubic feet.

There is an excellent site for a dam of any reasonable height near the location of the present one, and it is understood that the West Branch Driving & Reservoir Co. has already received authority from the State to construct a concrete dam here, the crest of which is to be about 4 feet higher than the spillway of the present Chesuncook dam. As the latter is at elevation 930.6 feet above sea level, the height of the dam at the outlet of Ripogenus will be about 50 feet. It is estimated that the increased storage afforded by this dam will amount to 8 to 10 billion cubic feet. The principal damage caused by increased flowage would be restricted to standing timber and to the flooding of a set of camps on the right shore.

CHESUNCOOK LAKE.

Chesuncook Lake is situated in townships 3, R. 12, 4, R. 12, 4, R. 13, and 5, R. 13. Its outlet is separated from the head of Ripogenus Lake by only 0.57 mile of river. The lake is about 17.7 miles long and from three-fourths mile to 1 mile wide. It is comparatively free from islands, has a fairly regular shore line, and the banks are for the most part fairly high, but in a few places the backwater from the dam covers a considerable area. The dam is a timber crib structure, built during the winter of 1903–4, and is in good condition. Its length is about 1,500 feet, and it contains six pairs of deep 8-foot by 8-foot gates, three pairs of shallow 8-foot by 12-foot gates, and one log sluice 25 feet wide. The dam controls a head of about 20 feet. The elevation of Chesuncook when drawn down to the deep-gate sills of the dam is 908.6 feet above mean sea level;[1] the elevation of the mean low water surface of Ripogenus Lake is about 883 feet, giving a difference in lake levels of about 25.6 feet. When Chesuncook is at full height high water is assumed to be at elevation 930.6 feet, although for a short time during the spring freshets it may exceed this figure.

About 5½ miles above the dam a deep inlet, known as Caribou Cove, connects with a lake of the same name lying west of Chesuncook. This lake is from 6¾ to 7 miles long, is about 1.4 miles broad in its center or widest part, and narrows to less than one-half mile near each end. It is fed by brooks and streams, the principal one, Ragged Stream, having its rise in Ragged Lake, which is about three-quarters the size of Caribou Lake. Numerous brooks and streams flow into Chesuncook. Umbazooksus and Caucomgomoc, the most important except West Branch, drain the lakes for which they are named. The headwaters of both are very near East Branch waters, Caucomgomoc Pond lying within a few miles of Allagash Lake, and Umbazooksus Lake being separated from Mud Pond, which drains into Chamberlain Lake by only 1.7 miles. The elevation of mean low water on Umbazooksus Lake is about 941 feet above sea level, that of Mud Pond is about 955, and that of Chamberlain is about 938 feet above sea level.

The area of Chesuncook at mean low water is about 18 square miles; when the lake is filled to the crest of the spillway of the dam (930.6 feet above sea level) the area is 32.1 square miles. When the water level in Chesuncook reaches its extreme elevation of 930.6 feet above sea level the backwater extends about 4.3 miles up the river, flooding out Pine Stream Falls and a part of Rocky Rips. Its effect is evident on Umbazooksus Stream for a distance of about 5 miles from its mouth, and, as the bordering country is chiefly low meadow land, the stream increases to a width of one-quarter to one-half mile. The backwater also extends up Cuxabexis Stream into Moose Pond and joins that of Umbazooksus.

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[1] See note in following table.

The drainage area at the entrance to Chesuncook Lake is 825 square miles; at the outlet the drainage area is 1,330 square miles.

The only damage to be caused by increased storage, other than that to standing timber, would be to the settlement at the upper end of the lake, and it is probable that this would be comparatively small.

The following table gives the area and capacity of Chesuncook Lake at different elevations:

Area and capacity of Chesuncook Lake at different elevations.

Elevation.[a]	Area of water surface.	Capacity of section.	Total capacity above elevation 913 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
911				Bottom of deep gates.
912.61				Lowest level of lake, December, 1905.
913				
915	18.1	1,010,000,000	1,010,000,000	
917	18.3	1,020,000,000	2,030,000,000	
919	18.5	1,030,000,000	3,060,000,000	
921	19.7	1,100,000,000	4,160,000,000	Bottom of shallow gates.
923	22.2	1,240,000,000	5,400,000,000	
924	23.9		6,100,000,000	Bottom of log sluice.
925	25.6	1,430,000,000	6,830,000,000	
927	28.0	1,560,000,000	8,390,000,000	
929	29.8	1,660,000,000	10,050,000,000	
931	31.6	1,760,000,000	11,810,000,000	
933	32.1	1,790,000,000	13,600,000,000	Crest of spillway.
935	35.9	2,000,000,000	15,600,000,000	Flashboards.
937	35.9	2,000,000,000	17,600,000,000	

[a] Elevations refer to Bangor & Aroostook R. R. datum; to obtain mean sea level subtract 2.38 feet.

CAUCOMGOMOC LAKE.

Caucomgomoc Lake is situated in Tps. 6, R. 14; 6, R. 15; 7, R. 14; and 7, R. 15. Its area is about 7 square miles (with water at crest of dam), and it is fed by several brooks and streams, some of which are connected with fair sized ponds. Its outlet, a stream about 12 miles long, flows into Chesuncook Lake at a point very near the inlet of the West Branch. The elevation of the lake is not known, but it is considerably higher than Chesuncook. Wadleigh Stream, a tributary of the lake, heads near Allagash Stream in the East Branch system.

An old timber dam at the outlet, used for driving, controls a head of about 8 feet. It is estimated that about 7 feet additional head could be obtained by proper development, giving about 8 or 9 square miles of water surface.

Area and capacity of Caucomgomoc Lake at different elevations.

Elevation above sill of dam.	Area of water surface.	Capacity of section.	Total capacity above sill of dam.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
0	5.15			Sill of dam.
5	6.33	800,110,000	800,110.000	
8	7.00	557.840.000	1,357,950,000	Crest of dam.
10	7.45	402.600.000	1,760,550 000	
15	8.50	1,112,300,000	2,872,850.000	

UMBAZOOKSUS LAKE.

Umbazooksus Lake is situated in T. 6, R. 13, and is only 1.7 miles from Mud Pond in the East Branch system. It covers an area of 1 to 1½ square miles and is very shallow. The flow of its outlet, a stream of the same name, is controlled by a timber dam (in poor repair) which gives a head of 5 or 6 feet. The elevation of the mean low water is about 942 feet above sea level.

STORAGE ON EAST BRANCH OF PENOBSCOT RIVER.

GENERAL CONDITIONS.

The East Branch of the Penobscot was originally formed by two branches, East Branch Stream, rising in the vicinity of Sink Pond, and Webster Brook, rising in Webster Lake. The chain of lakes lying just northwest of Webster Lake, Telos, Chamberlain, and Allagash lakes and Round Pond, flowed naturally into Eagle Lake and thence down Allagash River to the St. John. At high water, however, an overflow channel at the east end of Telos Lake carried water into a small brook tributary to Webster Lake. About 1840, in order to provide means for transporting logs over the divide between Telos and Webster lakes, a dam was built at the natural outlet of Chamberlain Lake toward Eagle Lake, and a canal cut from the east end of Telos Lake a distance of about 800 feet to connect with Webster Lake. As Chamberlain and Telos lakes had the same elevation and were connected, the flow from this series of lakes was thus turned into the East Branch of the Penobscot. This dam and canal made it possible to lumber on Chamberlain Lake territory and drive logs directly down the Penobscot.

Later, to permit of lumbering around Eagle Lake and driving down the Penobscot, a second dam was built at the natural outlet of Chamberlain Lake below the first dam, the two dams forming a lock into which logs could be driven and raised to the level of Chamberlain Lake. This lock was utilized for a number of years but was finally abandoned, and only the ruins of the original "lock dam" are now visible. The present dam at the natural outlet of Chamberlain is now known as the Lock dam.

The sills of the gates of the present lock dam are about 0.6 foot lower than those of the dam at the artificial outlet of Telos Lake, so that in very low water nearly or quite all the flow from Chamberlain Lake is into Eagle Lake.

About 1893, Marsh & Ayer, of Bangor, built a log carry called the "Tramway" from Eagle to Chamberlain Lake at a point near the north end of Chamberlain Lake, where the distance between the two lakes is only about three-fourths of a mile. This carry consists of an endless chain driven by steam power and is the means by which logs are now taken from the region about Eagle Lake and driven down the Penobscot.

It should be noted that under present conditions the drainage area tributary to Chamberlain and Telos lakes has become the principal headwaters of the East Branch of the Penobscot, the drainage area above the outlet of Telos Lake comprising 270 square miles and that between Telos Lake outlet and Grand Lake dam only about 226 square miles.

GRAND AND SECOND GRAND LAKES.

Grand and Second Grand lakes are situated in T. 6, Rs. 8 and 9, and are the first important lakes on the East Branch above its mouth. They are very irregular in shape, with many ragged points and deep coves, and are separated by a "thoroughfare" about 2 miles long. At low stages the elevation of the water surface is about 645 feet above sea level; at extreme low water Grand Lake is slightly lower than Second Grand Lake. From Grand Lake dam at its lower end to the head of Second Grand Lake the distance is about 8 miles. Their total area at mean low water is about 4.4 square miles, The drainage area at the mouth of Grand Lake is 496 square miles, including the Chamberlain Lake drainage area of 270 square miles.

The south shore of each lake is very rough and the banks are high, especially on Grand Lake, from the shores of which Trout Brook Mountains and the Traveler Range extend southward. The other portions of these two lakes have in general steep banks except in the vicinity of the "thoroughfare," where Trout Brook enters from the west, near the upper end of Grand Lake, and Hay Brook from the north, near the lower end of Second Grand Lake. At about the middle of the "thoroughfare," extending eastward about 1½ miles, is the "Big Lagoon," which is about 1,500 feet in maximum width and has low banks on its northern and eastern shores.

At the outlet of Grand Lake is a timber crib dam—a frail structure in need of repairs. The dam is about 185 feet long between ledge abutments and affords a head of 14 feet, the elevation of the gate sills being about 641.2 feet above sea level. There are five gates 8 feet wide and one sluice gate 17 feet wide. Several channels a short distance west of the dam, through which water would run at ordinary and high stages, are closed by cribwork and piling.

A dam of any reasonable height could be built at the outlet. Little or no damage would be caused by raising the lake level to an elevation of 665 feet above sea level or 20 feet above the ordinary low-water level.

The following table gives the areas and capacity of Grand and Second Grand lakes at different elevations:

Area and storage capacity of Grand and Second Grand lakes at different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 641.2 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
641.2	3.30	....	....	Gate sills, present dam.
645	4.40	407,900,000	407,900,000	Ordinary low water.
650	5.60	697,000,000	1,104,900,000	
655	6.63	854,100,000	1,959,000,000	Crest of present dam.
660	7.52	990,900,000	2,949,900,000	
665	8.36	1,106,800,000	4,056,700,000	
670	9.17	1,221,100,000	5,277,800,000	

WEBSTER LAKE.

Webster Lake is situated in Rs. 10 and 11 of T. 6, and, as previously noted, at its upper end is connected by an artificial canal with Telos Lake. It extends approximately east and west about 3 miles, is 2,000 feet in maximum width, and is fairly regular in shape. At low water, corresponding to an elevation of about 891 feet above sea level, the area of its water surface is 0.82 square mile. The shores are high and steep. Coffeelost Stream, entering from the north, and Thissell Brook, from the south, are small tributaries.

A timber crib dam with earth abutments affords a head of 7 to 9 feet. The dam is about 125 feet long with a wing of piling backed with earth about 250 feet long, and is in poor condition. The right bank at the dam is high and steep, but the left bank is low. The dam is used solely for log driving down Webster Brook, and the gates are usually raised after the drive has reached Indian Pitch dam, some 6 miles below Webster Brook.

The surface of this lake could readily be raised by a higher dam at the outlet. It is probable, too, that it could be drawn down at least 2 feet lower than at present, but the area of the lake is so small that it is not of much importance for storage except for log driving.

The following table gives its area and capacity at different elevations:

Area and capacity of Webster Lake at different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 891 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
886	0.72	...	...	
891	.82	107,300,000	...	Gate sills, present dam, and ordi-low water.
896	.91	119,900,000	119,900,000	
899	.96	78,620,000	198,500,000	Crest of present dam.
901	1.00	133,800,000	253,700,000	
906	1.08	145,000,000	398,700,000	
911	1.16	156,100,000	554,800,000	
916	1.23	167,300,000	722,100,000	

TELOS LAKE AND ROUND POND.

Telos Lake and Round Pond, situated mostly in T. 6, R. 11, are at the same level as Chamberlain Lake, to which they are connected by a "thoroughfare" about 4,000 feet long, extending northward from Round Pond. Telos Lake and Round Pond trend in a general northwest to southeast direction, are irregular in form, and are connected by a narrow passage; their combined area at low water is 3.7 square miles. Their total length is about 3 miles and the maximum width about a half mile. The shores are as a rule high and steep and thickly wooded. Telos Brook, entering Telos Lake from the west, and Bog Stream, entering Round Pond from the east, are small streams with some low land near their outlets.

The gate sills of the timber crib dam at the outlet of Telos Lake are at elevation 935.4 feet above sea level. The dam is capable of storing a head of about 13 feet, but at this elevation water would flow over the "lock dam" at Chamberlain Lake. The area and storage capacity of Telos Lake and Round Pond at different elevations are shown in the following table :

Area and storage capacity of Telos Lake and Round Pond at different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 935.4 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
932.9	2.82	...	...	
934.8	3.00	154,100,000	...	Gate sills, Lock dam.
935.4	3.04	50,520,000	...	Gate sills, Telos dam.
937.9	3.24	218,800,000	218,800,000	Ordinary low water.
942.9	3.64	479,500,000	698,300,000	
945.8	3.85	302,400,000	1,000,700,000	Crest of Lock dam, which is about 2½ feet lower than Telos Lake.
947.9	3.97	529,700,000	1,228,000,000	
952.9	4.28	574,300,000	1,802,300,000	
957.9	4.52	613,300,000	2,415,600,000	
962.9	4.76	646,800,000	3,062,400,000	

CHAMBERLAIN LAKE.

Chamberlain Lake, the largest lake now tributary to the East Branch of the Penobscot, is a long and comparatively narrow body of water resembling Chesuncook Lake, except that it is wider and more irregular in shape. It extends from northwest to southeast through several townships and is about 14 miles long; its maximum width is about 2 miles and the average width is about 1 mile. At low stage its water surface is about 938 feet above sea level (the same elevation as that of Round Pond and Telos Lake) and its area is 15.4 square miles.

The shores of the lake are in most places high and steep except at the entrance of Allagash Stream at the northwestern end and the outlet from Mud Pond on the south. Ellis Stream, on the west, and Leadbetter Stream, on the east, are other small tributaries. There are a few small islands, mostly in the half toward Round Pond. This lake is noted for its rough water, as the prevailing winds sweep from end to end and frequently for days at a time no ordinary boat or canoe will stay afloat.

As previously explained (see p. 172), the natural outlet of Chamberlain Lake is eastward toward Eagle Lake; but there is now an artificial outlet through Round Pond and Telos Lake controlled by the dam at the outlet of the latter. The Lock dam at the outlet of Chamberlain Lake toward Eagle Lake is a timber crib structure, with earth abutments reenforced by sheet piling, is some two or three years old, and is in excellent condition. There are two gates for letting water into Eagle Lake, but these gates are kept closed and calked nearly all the time. The dam is very tight and there is little or no leakage. It affords a head of about 11 feet, although with this amount there is an overflow about 1 foot deep for a short distance through the woods beyond one wing. It is stated that the channel from the lake to the dam has been blasted out so that at present the sills of the gates, which are at about elevation 934.8 feet above sea level, hold back about 3 feet of dead water.

The dam controlling flow by way of Round Pond and Telos Lake has been described previously (p. 172). It will be noted that the Lock dam has lower gate sills and also a lower crest elevation, so that if desired all flow from Chamberlain Lake can be turned via the Lock dam toward Eagle Lake.

Chamberlain Lake (with Round Pond and Telos Lake) constitutes an excellent storage basin and is capable of still further development. In all probability its surface could be maintained 15 or 20 feet higher than at present without great difficulty. The Chamberlain Farm settlement, situated on the north side of the lake, would be somewhat affected by such a change of lake level, but otherwise damage would be restricted to timber land only and would not be of material consequences.

No surveys were made to determine the effect of flooding the country around Mud Pond, which would occur if the surface of Chamberlain Lake were raised above elevation 956 feet above sea level (a rise of 20 feet above present low-water level), but it is probable that 2 or 3 square miles in the vicinity of Mud Pond could be flooded to a depth of 2 feet.

The drainage area tributary to these lakes, including their water surface, is 270 square miles. The area and storage capacity of Chamberlain and Telos lakes and Round Pond at different elevations is given in the following table:

Area and storage capacity of Chamberlain Lake at different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 935.4 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
932.9	13.65	....	....	
934.8	14.33	741,000,000	....	Gate sills, Lock dam.
935.4	14.52	241,300,000	....	Gate sills, Telos dam.
937.9	15.38	1,042,000,000	1,042,000,000	Ordinary low water.
942.9	16.92	2,251,000,000	3,293,000,000	
945.8	....	1,435,000,000	4,728,000,000	Crest of present dam.
947.9	18.26	2,452,000,000	5,745,000,000	
952.9	19.42	2,626,000,000	8,371,000,000	
957.9	20.45	2,780,000,000	11,151,000,000	
962.9	21.37	2,914,000,000	14,065,000,000	
Including Mud Pond (approximate)				
957.9	23.0±	2,956,000,000	11,327,000,000	
962.9	26.0±	3,415,000,000	14,742,000,000	

ALLAGASH LAKE.

Allagash Lake, in Tps. 7 and 8, R. 14, is situated about 5½ miles northwest of Chamberlain Lake, to which it is connected by Allagash Stream. It is in general rectangular but rather irregular in shape and contains many islands. At ordinary low water, when its area is 6.85 square miles, its elevation is 1,041.5 feet above sea level. Its elevation is higher than that of any other body of water of considerable size on the headwaters of the East Branch. Its shores are steep and wooded except near the principal inlet, Allagash Stream, on the west, where some lowland exists. There are no other important inflowing streams. The drainage area at the outlet of Allagash Lake is 102 square miles.

A timber crib dam, 40 feet long, with a wing of sheet piling reenforced with earth, controls a head of 7 or 8 feet at the outlet of the lake. It is in rather poor condition. The waterway consists of three gates about 9 feet wide, the sills of which are at elevation 1,037 feet above sea level. The dam is used solely for log driving, and the gates are left open after the driving season is over.

Allagash Lake affords a good opportunity for additional storage, as there are no settlements near by and only standing timber would be damaged. A dam could be built to any reasonable height a short distance above the present dam, where a high ledge bank appears on one shore.

The following table gives the area and capacity of Allagash Lake at different elevations:

Area and storage capacity of Allegash Lake at different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 1,037 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
1,036.5	6.40	....	....	
1,037	6.46	89,630,000	....	Gate sills, present dam.
1,041.5	6.85	835,500,000	835,500,000	Ordinary low water.
1,044	7.05	....	1,320,000,000	Crest of present dam, approximate.
1,046.5	7.22	979,900,000	1,815,400,000	
1,051.5	7.55	1,029,000,000	2,844,400,000	
1,056.5	7.81	1,071,000,000	3,915,400,000	
1,061.5	8.05	1,105,000,000	5,020,400,000	
1,066.5	8.27	1,138,000,000	6,158,400,000	
1,071.5	8.47	1,167,000,000	7,325,400,000	

STORAGE ON MATTAWAMKEAG RIVER.

BASKAHEGAN LAKE.

Baskahegan Lake is located in the towns of Brookton and Topsfield. It is about 5 miles long from southwest to northeast and is very irregular in shape. At ordinary low water its surface is probably about 450 feet above sea level and its area is about 12.5 square miles. It is a shallow lake, the greatest depth, about in the middle, being 35 feet. The shores rise rather gradually as a rule, and there are large tracts of low land near the outlet brook and Dead Brook Inlet on the north. The most important inlet is Alder Brook, which enters near the southwestern part of the lake. Baskahegan Stream, the outlet of Baskahegan Lake into Mattawamkeag River, flows in a general northerly direction and reaches the river in the town of Bancroft, falling about 110 feet in some 18 miles. The drainage area at the outlet of the lake is 151 square miles.

At the outlet of the lake a dam with 6 gates, making with timber crib piers a length of 103 feet and with additional wings of concrete aggregating 175 feet, controls a head of 7 feet. There is also a low dike or wall of loose rock and gravel about 800 feet long, mostly on the east side of the dam. This dam is used solely for log driving, and the gates are left open after the drive is over. By placing a dam at the sharp bend in the outlet stream known as "Weber

Place," about 1.5 miles below the present dam, where the bed of the river is of gravel and the banks are high, and by building an earth dam or dike at the low area near "Dung Fork Points," at the northeast corner of the lake, an increased storage depth of 10 to 12 feet could readily be provided. As the shores are practically wild flooding could cause little damage.

The areas and storage capacity of Baskahegan Lake at different elevations are given in the following table:

Area and storage capacity of Baskahegan Lake at different elevations.

Elevation above crest of present dam.	Area of water surface.	Capacity of section.	Total capacity above elevation of lowest gate sill.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
−7	8.6			Lowest gate sill.
0	16.4	2,468,000,000	2,468,000,000	Crest of present dam.
5	20.4	2,565,000,000	5,033,000,000	
10	23.0	3,025,000 000	8,058,000,000	
15	25.2	3,360,000,000	11,418,000,000	
20	27.1	3,652,000,000	15,070,000,000	

MATTAWAMKEAG LAKE.

Mattawamkeag Lake, the largest lake on the West Branch of Mattawamkeag River, lies in the town of Island Falls and T. 4, R. 3. It is about 7.2 miles long, 2.4 miles in maximum width, trends in general northwest to southeast, and is very irregular in shape. It is approximately 464 feet above sea level and about 6 square miles in area. It is comparatively shallow, the maximum depth, about 50 feet, occurring north of Big Island, near the south end of the lake. The shores are low and flat at the northwest and southeast ends of the lake and high elsewhere. The drainage area at the outlet of Mattawamkeag Lake is 305 square miles.

A number of small, unimportant brooks enter the lake along the eastern shore. The West Branch of Mattawamkeag River, the principal inflowing stream, enters on the western shore. Its mouth is about 2 miles from the head of the lake, but its course parallels the lake for nearly a mile, and a cut-off connection is used for log driving at high water.

The present dam is a timber-crib structure, built about 1862, two previous dams at this place having been washed out soon after they were built. The dam is in rather poor condition and has been repaired many times. It is about 375 feet long, of which 145 feet consists of wasteways and sluice gates, and affords a head of about 8.5 feet. On the right bank the ground rises gradually and is about 10 feet higher 150 feet from the end of the existing wing wall; on the east side the rise is rather more abrupt for a short distance and then gradual.

High water on this lake causes much flooding of low lands, and though the height of the present dam could be increased without difficulty, it is probable that damages by pondage would be extensive, as they would include the partial flooding out of a 9-foot fall at the village of Island Falls, about 7 miles upstream, utilized by the Emerson Lumber Co. The present maximum height could, however, be maintained most of the year and would afford considerable storage, and cause damage only to timber land.

The following table gives the area and capacity of Mattawamkeag Lake at different elevations:

Area and storage capacity of Mattawamkeag Lake at different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 455 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
455	4.52			Gate sills, present dam.
457	4.90	262,600,000	262,600,000	
460	5.41	431,600,000	694,200,000	
462	5.72	310,000,000	1,004,200,000	
464	6.02	327,300,000	1,331,500,000	Crest, present dam.
465	6.19	170,100,000	1,501,600,000	Probable limit of high water without excessive damage at Island Falls.

PLEASANT LAKE.

Pleasant Lake, situated in the town of Island Falls and T. 4, R. 3, trends approximately northwest to southeast, and discharges into the East Branch of Mattawamkeag River by an outlet about half a mile long. It is fairly regular in shape, about 4 miles long, 1 mile in maximum width, and 2¼ square miles in area, and lies approximately 600 feet above sea level. Its water is very clear and is deep, the maximum being 65 feet. There are a few small islands.

The shores are wooded and rise abruptly from the water's edge, the western shore being somewhat steeper than the eastern. At the head of the pond there is some low land. No large streams enter this pond, and it seems probable that much of its water comes from springs, as the elevation of the pond surface is very nearly constant, having an extreme range of only about 2 feet.

An old dam, the ruins of which still exist, formerly controlled the flow of this pond, but the pond is not utilized at present for storage. At this old site the water surface could be raised about 7 feet by means of a dam, with a total length of 650 feet, all but 30 feet of this being wing walls; or the pond could be lowered 3 feet by dredging the channel for a few hundred feet.

A higher dam might be built at this site (a height of 20 feet above present pond level requiring a total length of dam of about 1 800 feet), but the drainage area directly tributary to Pleasant Lake comprises only a few square miles, and the pond would be useful for storage only by diverting flow from the East Branch of the Mattawamkeag. This might be done by a dam just below the junction of Pleasant Lake outlet with the East Branch (about half a mile from the pond and some 30 feet lower) or by a diversion dam and canal farther up the East Branch.

It should also be noted that Pleasant Lake is nearly 140 feet higher than Mattawamkeag Lake, and it is therefore possible to divert water to Mattawamkeag Lake by cutting through the dividing low land at the west side of Pleasant Lake. This distance is said to be about half a mile, and the maximum depth of the canal would be about 10 feet.

The drainage area of the East Branch of Mattawamkeag River just below Pleasant Lake outlet is 79 square miles. The area and storage capacity of Pleasant Lake at different elevations are shown in the following table:

Area and storage capacity of Pleasant Lake at different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 595 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
595	2.08	....	....	Proposed elevation of outlet; to be obtained by dredging.
598	2.20	178,980,000	178,980,000	Present elevation of outlet.
600	2.27	124,900,000	303,880,000	
602	2.34	....	....	Present elevation of crest of old dam.
602.5	2.35	161,000,000	464,880,000	
605	2.42	165,900,000	630,780,000	
607.5	2.50	171,500,000	802,280,000	Probable limit of high water without excessive expense for dam, etc.
610	2.55	175,600,000	977,880,000	
620	2.75	738,800,000	1,716,680,000	

STORAGE ON PISCATAQUIS RIVER.

SCHOODIC LAKE.

Schoodic Lake, Piscataquis County, lies mostly in T. 4, R. 8 N.W.P. It trends in a general north-south direction, is about 8¾ miles long, and opposite Howard Cove, on the west shore, about 5.5 miles from the upper end, is 2.5 miles wide. The lake is rather irregular in shape, and contains a number of small islands, a group near the east shore being known as Five Islands. The lake as a whole is deep, the maximum depth above Five Islands being 75 feet, and south of this point 155 feet. In the vicinity of Norway Point, toward the lower end of the lake, is an extensive area more than 100 feet deep.

At ordinary level Schoodic Lake is about 430 feet above sea level, and the area of water surface is 10.75 square miles. The shores are in general high, and the banks steep except in the vicinity of Howard

Cove, an area on the west shore near the northern end of the lake, and a portion of the east shore near Five Islands. No streams of any magnitude enter the lake, and the tributary drainage area is small (32 square miles). The outlet, Schoodic Stream, enters Piscataquis River in the town of Medford, about 4 miles from the lake, in which distance it falls some 200 feet.

There are three lines of railroad in the vicinity of Schoodic Lake. The main line of the Bangor & Aroostook Railroad passes about 500 feet west of the head of the lake some 50 feet above ordinary water level. The Medford extension of this railroad (built during 1907) skirts the eastern shore and is in places only 5 feet above ordinary lake surface. The Canadian Pacific Railway runs by the south end of the lake and along its west shore for a short distance. At its lowest portion it is about 12 feet above lake surface. At the outlet of Schoodic Lake, about 600 feet downstream from the Bangor & Aroostook Railroad bridge, is a broken-down and decaying timber dam, owned by the American Spool Co. The dam is very irregular in shape, about 250 feet long, and controls a 3-foot head. Originally, there were two sluice gates, each about 7 feet wide, but one gate is now entirely gone, and the other leaks badly.

The depth of water could be increased 8 to 10 feet above ordinary level by placing a dam some 700 feet above the old dam and 100 feet above the Bangor & Aroostook Railroad bridge, but such a change of lake level would entail considerable damage. Schoodic Lake is rapidly becoming a popular summer camping place, and its shores are dotted with numerous public and private camps. Further, the settlement at Lakeview, mostly the buildings of the American Spool Co., would be damaged by a rise of more than 5 feet, as would also the new Medford extension of the Bangor & Aroostook Railroad. It is doubtful, therefore, whether any elevation of water surface greater than 2 or 3 feet above the present level is feasible. If properly repaired, the present dam would probably control the run-off from the drainage area. The area and capacity of Schoodic Lake at different elevations are given in the following table:

Area and capacity of Schoodic Lake at different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 428.5 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
428.5	10.65			Probable elevation of outlet.
430	10.75	447,500,000	447,500,000	
432.5	10.92	754,800,000	1,202,300,000	Probable present limit of storage.
435	11.07	766,700,000	1,969,000,000	Probable limit of storage on account of damage.
437.5	11.18	775,000,000	2,744,000,000	
440	11.29	782,700,000	3,526,700,000	

SEBOEIS LAKE AND NORTHWEST POND.

Seboeis Lake lies in T. 4, Rs. 8 and 9, N. W. P., the largerpart being in T. 8. It trends in a general north-south direction, is 6.8 miles long, 1.4 miles in maximum width (near its north end), and its water surface comprises 6.2 square miles at an elevation about 440 feet above sea level. From about the middle of its eastern shore a bay leads to the outlet stream; on the western shore a bay leads to the "thoroughfare" to Northwest Pond. Of the numerous islands in the lake, Leyford Island, the largest, situated near the western shore and about midway of the lake, is over a mile long and about a half mile wide. North of Leyford Island the average depth of the lake is 50 feet, and the maximum depth, 80 feet, is found just northeast of the island. South of Leyford Island the lake is rather shallow.

All of the northern shore is low. The lowland extends back for a mile or more to the vicinity of the Bangor & Aroostook Railroad and the northeastern inlet flows through a long narrow swamp stretching back several miles. Other low areas exist near the east outlet and in the vicinity of the "thoroughfare" to Northwest Pond. The remaining shores are in general rough and rise fairly steep from the water's edge.

The inflowing streams are Northeast Inlet and one or two smaller brooks. The outlet bay of the lake is a long, gradually narrowing and winding arm, about a mile long, from which Seboeis Stream flows into Endless Lake, about 1.5 miles distant, and thence to Piscataquis River.

Northwest Pond, or Little Seboeis Lake, as it is often called, is situated in T. 4, R. 9 N. W. P., and is practically a part of Seboeis Lake, with which it is connected by a short "thoroughfare." It lies west of the northern portion of Seboeis Lake. Northwest Pond trends northwest to southeast, is 1.4 miles long and about half a mile in maximum width, and its pond area is about one-half square mile. It is at the same elevation as Seboeis Lake. The "Tongue," which separates it from Seboeis, is about half a mile in average width.

The Medford extension of the Bangor & Aroostook Railroad passes about 800 feet west of the pond and joins the main line of the railroad in the vicinity of the Northwest Pond station. The railroad at its lowest point is about 4.5 feet above pond surface.

The eastern shore of the lake rises gradually, but the other shores of the pond are in general low. At the northern end a large swamp extends back to the railroad and swings around toward the lowland at the head of Seboeis Lake. The only important inflowing stream enters at the northeastern end and drains a very small area.

The drainage area at the outlet of Seboeis Lake is 49 square miles.

The outlet of Seboeis Lake is controlled by a timber crib dam about 40 feet long in the main portion and with wings aggregating 250 feet. The dam affords a head of about 8 feet and is regulated by two gates. No ledge appears at the dam and it is probable that the foundation is gravel.

The contour of the ground at the present dam controlling the outlet of Seboeis Lake, and consequently of Northwest Pond, would admit of an increase in height of dam from 5 to 8 feet without greatly increasing its length. A 10-foot rise, however, would require a dam about 1,700 feet long, and a dam built to reach the 20-foot level above ordinary water surface would be more than 2,000 feet long.

On both Seboeis Lake and Northwest Pond are several camps which would be affected by any considerable increase in height of water level, and the railroad near Northwest Pond would be affected by any rise exceeding 4 or 5 feet.

Considering the small drainage area tributary to the lake, it seems probable that little increase in height of water level at this point would be practicable.

The area and capacity of Seboeis Lake, including Northwest Pond, at different elevations are given in the following table:

Area and capacity of Seboeis Lake and Northwest Pond at different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 432 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
432	5.63	....	....	Probable elevation of outlet.
432.5	5.69	78,900,000	78,900,000	
435	5.93	404,900,000	483,800,000	
437.5	6.19	422,400,000	906,200,000	
440	6.4	439,100,000	1,345,300,000	Probable present limit of storage.
442.5	6.63	454,400,000	1,799,700,000	
445	6.82	468,400,000	2,268,100,000	Limit of storage on account of excessive damage.

ENDLESS LAKE.

Endless Lake, or Trout Pond, as it is sometimes called, situated in T. 3, R. 9, N. W. P., trends in general north and south. It is fairly regular in shape, the eastern shore being almost a straight line, is 4.3 miles long and about 1.25 miles in maximum width, and is 400 feet above sea level, at which elevation the area of water surface is 2.57 square miles. Its depth is fairly uniform, the maximum being 35 feet near the middle and toward the southern end of the lake. There are several small islands. The shores are in general steep and the lake is surrounded on all sides by high hills either at or a little back from the shore. Seboeis Stream, flowing from Seboeis Lake, enters from the west. Near its northeastern end the lake receives the outlet of Flat Iron Pond, which lies about three-eighths of a mile from Endless Lake and some 40 feet above it. The drainage area at the outlet of Endless Lake is 66 square miles, of which about 10 square miles is water surface (principally Seboeis and Endless lakes and Northwest Pond).

A timber crib dam, 77 feet long, with additional wings increasing the aggregate to 130 feet, controls the outlet of the southern end of the lake, is regulated by three gates, and affords a head of about 8 feet. The contour of the shores in the vicinity of this dam is very favorable for an increased elevation of water surface. An additional depth of 20 or 30 feet could doubtless be maintained without especial difficulty, but, in view of the small tributary drainage area, it is probable that a greater height of dam is not warranted. The area and storage capacity of Endless Lake at different elevations are given in the following table:

Area and capacity of Endless Lake at different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 392 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
392	1.86	....	....	Sill of dam.
395	2.16	168,100,000	168,100,000	
397.5	2.38	158,200,000	326,300,000	
400	2.57	172,800,000	499,100,000	Crest of dam.
402.5	2.75	185,400,000	684,500,000	
405	2.90	196,500,000	881,000,000	
407.5	3.05	207,700,000	1,088,700,000	
410	3.18	217,500,000	1,306,200,000	

LOWER EBEEMEE LAKE.

Lower Ebeemee Lake is situated principally in the southeastern part of T. 5, R. 9. It is very irregular in shape, consisting practically of three ponds joined by narrow channels. The most easterly of these channels has been examined with reference to diversion of water to Schoodic Lake. At the time of the observation (July, 1907) the water surface of Ebeemee Lake was at about elevation 425 feet above sea level, or 5 feet lower than that of Schoodic Lake. The divide between the lakes rises perhaps 30 to 40 feet above Ebeemee Lake. The outlet of Ebeemee Lake is said to be controlled by a dam about 50 feet long, affording a head of 8 feet and used for log driving. This dam could be raised sufficiently to effect diversion. The distance across the divide between the two lakes is between 1.5 and 2 miles, and the diversion would add to the drainage area of Schoodic Lake some 87 square miles. Considering the large fall of Schoodic Stream (over 200 feet in about 4 miles), this project may sometime be executed.

SEBEC LAKE.

Sebec Lake, Piscataquis County, lies in the towns of Willimantic, Foxcroft, Sebec, and T. 7, R. 8, and its waters join Piscataquis River, in the town of Milo, about 7 miles from the mouth of the lake at Sebec village. The lake trends in general east and west, and its eastern end is narrow and elongated. The northern shore is rather steep, but the southern is lower. On the north the drainage area extends nearly to Moosehead Lake; on the south it adjoins that of the Piscataquis.

Sebec Lake is fed by many ponds and lakes, the most important being Onawa Lake, Long Pond, Bear Pond, the three Buttermilk ponds, and Benson, Monson, Hebron, Spectacle, Grindstone, Davis, Little Bennet, and Big Bennet, Beaver, and Wilson ponds. Many of these water bodies could be made to afford increased storage, and the outlets of some of them are already dammed. The combined area of these ponds is estimated to be about equal to the area of Sebec Lake. The drainage area tributary to the outlet at Sebec village embraces about 367 square miles. It is for the most part thickly wooded with mixed growth.

A dam at the outlet of Sebec Lake formerly furnished power to run several mills, but very little power is being used at the present time. The dam is a timber crib structure in poor repair. The head obtained by this dam averages perhaps 11½ feet. With a 12-foot head the water is at the top of gates and flowing 4 feet deep over the wasteway. It is estimated that an additional head of 3 feet, or a total of 15 feet, would flood many cottages on the south shore of the lake, but other than this an additional 5-foot head, or a total of 17 feet, would not do excessive damage to cultivated land or timber.

Only a part of the fall at the outlet has been developed, and for some distance below the stream has considerable fall, at least a part of which could be utilized. The flow is said to be fairly steady, even in dry years, and little difficulty arises from freshets.

The following table gives the area and capacity of Sebec Lake at different elevations:

Area and capacity of Sebec Lake for different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 315.3 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
315.3	9.08		....	Sill of gates.
316.7	9.32	359,074,000	359,074,000	
321.7	10.19	1,360,466,000	1,719,540.000	Water surface, Sept. 4, 1910.
326.7	10.83	1,465,010,000	3,184,550,000	
327.3	10.93	181,990,000	3,366,540,000	Top of dam.
331.7	11.68	1,386,114,000	4,752,654,000	

SILVER LAKE.

Silver Lake, the source of Pleasant River, is located in Katahdin Iron Works Township, at the terminal of a branch railroad. The remains of the old iron furnaces that were formerly operated are at the outlet of the lake.

The dam at the outlet is a timber structure in fair repair, and is now used chiefly for log driving. Little damage except to standing timber would arise from increasing the height of the dam and enlarging the capacity. The additional storage would benefit the power developments below. The drainage area embraces 104 square miles and is a heavily wooded, mountainous country.

The following table gives the areas and capacities of this lake at various elevations:

Area and capacity of Silver Lake for different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 587.3 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
587.3	0.29		....	Sill of gates.
587.6	.31	2,509,000	2,509,000	Water surface, Aug. 15, 1910.
592.3	.57	57,653,000	60,162,000	Top of dam.
593.1	.70	14,274,000	74,436,000	
597.3	1.37	121,773,000	196,209,000	
606.3	2.10	242,542,000	438,751,000	
611.3	2.63	328,965,000	767,716,000	

HOUSTON POND.

Houston Pond is located in T. 7, R. 9, 4 miles southwest of Silver Lake.

The dam is a crib structure in poor repair. Raising the level of the lake would cause damage only to a few summer cottages and to the timber land that would be flooded. The area drained comprises 21 square miles.

The following table gives the areas and capacities of this pond for various elevations:

Area and capacity of Houston Pond for different elevations.

Elevation above mean sea level.	Area of water surface.	Capacity of section.	Total capacity above elevation 817.2 feet.	Remarks.
Feet.	*Sq. miles.*	*Cubic feet.*	*Cubic feet.*	
817.2	0.99		....	Sill of gates.
819.3	1.02	58,545,000	58,545,000	Water surface Aug. 11, 1910.
822.2	1.07	84,081,000	142,626,000	
827.2	1.14	153,331,000	295,957,000	Top of dam.
830.3	1.19	100,251,000	396,208,000	
832.2	1.22	63,563,000	459,771,000	
837.2	1.30	175,634,000	635,405,000	

ADDITIONAL STORAGE BASINS.

COLD STREAM POND.

Cold Stream Pond is really a series of ponds, situated principally in the towns of Enfield and Lincoln and having a total water surface of about 10 square miles. The ponds are irregular in shape, the largest being of about 8 square miles in area. The outlet, a stream of the same name, is about 4½ miles long and flows into Passadumkeag Stream about one-half mile above its junction with the Penobscot. The drainage area at the junction with Passadumkeag embraces about 37 square miles.

The basin is for the most part wooded and but sparsely settled.

This pond would afford an excellent source of water supply for some town or city.

NICATOUS LAKE.

Nicatous Lake is situated in Tps. 3 N. D. and 40 and 41 M. D. The outlet of the lake, Nicatous Stream, is tributary to Passadumkeag Stream. The waters of Nicatous approach very close to those of Machias River.

The area of this lake is 8.82 square miles. It is probable that the water surface can be raised, so that about 10 feet would be available for storage. A dam already exists at the outlet.

The lake is fed by several brooks, some of which rise in small ponds, the three principal ones being Duck Pond and Gassabias Lake and West Lake, with a total water surface of perhaps 3 or 4 square miles. Though dammed at their outlet Gassabias and West lakes would doubtless be flooded by a not excessive rise of Nicatous, but the drop between Duck Pond and Nicatous is probably sufficiently great to prevent overflow to the former.

PUSHAW LAKE.

Pushaw Lake is in the towns of Hudson, Glenburn, Oldtown, and Orono. Its greatest length is about 7¼ miles, and its greatest width about 2¼ miles. The average width of the northerly three-quarters is one-half to three-fourths of a mile. Several islands and ledges appear. The lake lies nearly north and south. Its area is about 7½ square miles. It is fed chiefly by springs and bogs. Its one inlet, Pushaw Stream, has several branches and drains very low country until it reaches the town of Hudson, about 2½ miles from the lake, where it flows between higher banks, but it passes into marsh again before reaching the lake.

Pushaw Stream leaves the lake at the north end, 1½ miles from the point of inflow and joins the Penobscot a short distance above the city of Oldtown. The drainage area at this point embraces about 263 square miles, including that of Dead Stream, which joins Pushaw Stream about 1½ miles below the lake and which rises in a small lake, called Boyd Lake, situated about 2½ miles south of Piscataquis River.

The western shores of the lake are bordered by much high land, but to the south and east is low country, which, during the spring, is entirely overflowed. This territory includes a pond of perhaps one-half square mile, called Mud Pond, which is merely a bog hole draining into the stream.

The elevation of the lake is 117 feet above sea level. If the surface should be raised 3 feet, its area would be more than 22 square miles and its aggregate storage capacity would be 1,233,600,000 cubic feet. This estimate does not include the pondage likely to occur north of that part of Pushaw Stream flowing through the town of Alton.

The shores of the lake are only thinly settled, but along the southern half are many summer cottages. The higher land to the west is farmed, but most of that to the east for 1 to 1½ miles is unfit for agriculture.

PHILLIPS LAKE.

Phillips Lake, which lies wholly in the town of Dedham, about 10 miles southeast of Bangor, receives drainage from a basin comprising about 11.5 square miles. Its area is about 1.4 square miles. Its shores are as a rule rocky, the adjacent country mostly wooded and but sparsely settled, and its water is apparently of excellent quality and of considerable depth.

The lake has two outlets. The greater part of the outflow passes from the north end of the lake northward through the village of East Holden, thence southward through Long Pond, and into Penobscot River below Rucksport; the total length of this outlet is 18 miles. The other outflowing stream flows from the southeast end of the lake into Green Lake and thence into Union River; this outlet carries water only during medium and high stages.

SUMMARY OF STORAGE.

The preceding descriptions show that the present more important developed storage area amounts to 156.4 square miles, and that the area available for storage is 202.4 square miles.

The following summary takes account of the more important lakes, but there are many smaller, widely scattered ponds which are capable of increased storage:

Summary of storage.

	Present storage.	Available storage.
	Cubic feet.	*Cubic feet.*
West Branch of Penobscot River:		
Chesuncook Lake	15,600.000,000	22,901,100,000
Ripogenus Lake	301,100,000	
Twin Lakes system	14,880,000,000	14,880,000,000
Caucomgomoc Lake	1,357,950,000	2,872,850,000
East Branch of Penobscot River:		
Allagash Lake	1,320,000,000	6,158,400,000
Chamberlain Lake	4,728,000,000	11,327,000,000
Telos Lake and Round Pond	1,000,700,000	2,415,600,000
Webster Lake	198,500,000	554,800.000
Second and Grand lakes	1,959,000,000	4,056,700,000
Mattawamkeag River:		
Mattawamkeag Lake	1,331,500,000	1,501,600,000
Baskahegan Lake	2,468,000,000	10,000,000,000
Pleasant Pond	253,100,000	802,230,000
Piscataquis River:		
Sebec Lake	3,366.540,000	4,752,650.000
Schoodic Lake	1,202,300,000	1,969,000.000
Seboes Lake and Northwest Pond	1,345,300,000	2,268,100,000
Endless Lake	499,100,000	881.000,000
Silver Lake	74,440,000	767,720.000
Houston Pond	396,210,000	635,410.000
Main River:		
Pushaw Lake	....	1,233,600,000
	52,281,740,000	89,977,810.000

LAKE AREAS.

The State Water Storage Commission has computed from planimeter measurements lake and pond areas in the Penobscot basin. The maps used for this purpose included the special lake survey maps previously described, the topographic sheets of the United States Geological Survey, the series of township maps in the office of the State board of assessors, and recent private reservoir and township maps. The results of these area measurements of the ponds and lakes which bear names are included in the gazetteer, pages 221 to 279. In addition to this there are 214 other ponds which, because they are unnamed, are not described in the gazetteer. Their location and areas may be ascertained by application to the State Water Storage Commission at Augusta, Me. The general facts concerning both named and unnamed lakes and ponds are given in the following table.

Summary of areas of lakes and ponds in Penobscot basin.

Tributary to—	Drainage area.	Number.	Lake surface area.	Ratio water surface to drainage area.
	Sq. miles.		*Sq. miles.*	
West Branch	2,100	230	172.4	12.2
East Branch	1,130	105	61.6	18.4
Mattawamkeag	1,500	51	44.8	33.5
Piscataquis	1,500	119	65.3	23.0
Passadumkeag	383	28	29.4	13.0
Main River	1,957	77	40.0	49.0
	8,570	610	413.5	20.7

EFFECT OF PRESENT STORAGE ON FLOW.

BASE DATA.

The only complete set of data available for the study of the regimen of flow of the Penobscot is furnished by the 9-year record of discharge of the West Branch at Millinocket. This record is especially valuable because it covers observations during a very dry period (1903–4), and therefore affords an excellent basis for the study of the effect of storage in this basin.

The river above Millinocket is largely controlled by the Twin Lakes and Chesuncook Lake reservoir systems, so that the discharge at Millinocket is artificial for the greater part of the time. Occasionally in the spring some waste water passes Millinocket, and during the summer months, especially July and August, some excess of water has to be let out for log driving. Normally the discharge is kept at about 2,000 to 2,500 second-feet.

A careful record of the level of Twin Lakes and Chesuncook Lake has been kept by the Great Northern Paper Co. during this period, and the discharge at Millinocket corrected for storage in these lakes has been computed and the results have been furnished to the United States Geological Survey by Mr. H. S. Ferguson, engineer for the company.

The following table gives the discharge at Millinocket, both as observed and as corrected for storage, and also similar figures for the gaging station at West Enfield, well down on the main river. The correction for storage does not take account of the increased amount of evaporation due to raising the level (and increasing the area) of these lakes, but as this is only a small percentage increase when compared to the total water-surface area above Millinocket, no error of consequence can result.

Effect of storage of water on West Branch of Penobscot River above Millinocket on flow at Millinocket and at West Enfield.

Month.	Discharge at Millinocket.				Discharge at West Enfield.			
	As observed.		As corrected for storage.		As observed.		As corrected for storage.	
	Second-feet.	Second-feet per square mile of drainage area.	Second-feet.	Second-feet per square mile of drainage area.	Second-feet.	Second-feet per square mile of drainage area.	Second-feet.	Second-feet per square mile of drainage area.
1901.								
January	1,430	0.76	800	0.42	....	....	....	....
February	1,630	.87	842	.45	....	....	....	....
March	1,620	.86	727	.39	....	....	....	....
April	9,450	5.03	12,300	6.55	....	....	....	....
May	6,580	3.50	8,160	4.35	....	....	....	....
June	2,650	1.41	2,400	1.28	....	....	....	....
July	3,600	1.91	1,400	.75	....	....	....	....
August	2,580	1.37	1,840	.98	....	....	....	....
September	2,600	1.38	707	.38	....	....	....	....
October	1,360	.72	410	.22	....	....	....	....
November	656	.35	640	.34	....	....	....	....
December	1,160	.62	3,140	1.67	....	....	....	....

Effect of storage of water on West Branch of Penobscot River above Millinocket on flow at Millinocket and at West Enfield—Continued.

Month.	Discharge at Millinocket.				Discharge at West Enfield.			
	As observed.		As corrected for storage.		As observed.		As corrected for storage.	
	Second-feet.	Second-feet per square mile of drainage area.	Second-feet.	Second-feet per square mile of drainage area.	Second-feet.	Second-feet per square mile of drainage area.	Second-feet.	Second-feet per square mile of drainage area.
1902.								
January	2,130	1.13	2,600	1.38	8,060	1.22	8,530	1.29
February	2,270	1.21	2,160	1.15	....	....	....	....
March	5,380	2.86	4,680	2.49	....	....	....	....
April	11,800	6.28	14,600	7.77	39,000	5.91	41,800	6.34
May	9,460	5.03	10,200	5.43	22,900	3.47	23,600	3.57
June	9,390	5.00	9,400	5.00	28,000	4.24	28,000	4.24
July	2,400	1.28	860	.46	13,300	2.02	11,800	1.79
August	2,620	1.39	1,150	.61	9,430	1.43	7,960	1.21
September	2,170	1.15	1,400	.74	5,220	.79	4,450	.67
October	2,290	1.22	2,980	1.59	7,000	1.06	7,690	1.16
November	2,450	1.30	3,700	1.97	8,640	1.31	9,890	1.50
December	2,660	1.41	2,300	1.22	....	....	....	....
1903.								
January	1,630	.87	951	.51	....	....	....	....
February	1,860	.99	872	.46	....	....	....	....
March	5,770	3.07	5,140	2.74	....	....	....	....
April	13,300	7.07	17,200	9.15	34,800	5.27	38,700	5.86
May	6,450	3.43	8,290	4.40	13,900	2.11	15,740	2.39
June	2,120	1.13	1,600	.85	6,250	.95	5,730	.87
July	2,430	1.29	871	.47	6,960	1.05	5,390	.82
August	3,330	1.77	1,270	.68	6,280	.95	4,220	.64
September	1,920	1.02	110	.06	4,380	.66	2,570	.39
October	790	.42	238	.13	2,260	.34	1,710	.26
November	387	.21	413	.22	2,780	.42	2,810	.43
December	430	.23	502	.27	....	....	....	....
1904.								
January	328	.17	344	.18	....	....	....	....
February	365	.19	304	.16	....	....	....	....
March	527	.28	449	.24	....	....	....	....
April	1,000	.53	2,860	1.52	....	....	....	....
May	5,090	2.71	12,300	6.55	38,200	5.79	45,400	6.88
June	3,690	1 96	2,910	1 55	13,900	2.11	13,100	1.98
July	3,200	1.70	1,450	.77	8,750	1.33	7,000	1.06
August	3,400	1.81	1,110	.59	6,990	1.06	4,700	.71
September	2,160	1.15	2,060	1.10	7,360	1.12	7,260	1.10
October	2,210	1.18	4,310	2.30	10,600	1.61	12,500	1.89
November	2,300	1.22	1,810	.96	7,460	1.13	6,970	1.06
December	2,160	1.15	740	.39	....	....	....	....
1905.								
January	2,230	1.19	700	.37	....	....	....	....
February	2,180	1.16	342	.18	....	....	....	....
March	1,720	.91	370	.20	....	....	....	....
April	2,220	1.18	5,910	3.15	....	....	....	....
May	6,050	3.22	8,700	4.64	17,100	2.59	19,750	2.99
June	2,660	1.41	3,900	2.08	8,480	1.28	9,720	1.47
July	2,400	1.28	1,630	.87	5,510	.84	4,740	.72
August	3,070	1.63	330	.18	5,000	.76	2,260	.34
September	2,300	1.22	100	.05	4,070	.62	1,870	.28
October	1,470	.78	100	.05	2,740	.42	1,370	.21
November	432	.23	294	.16	2,630	.40	2,490	.38
December	409	.22	278	.15	....	....	....	....
1906.								
January	403	.21	436	.23	....	....	....	....
February	746	.40	740	.39	....	....	....	....
March	688	.37	713	.38	....	....	....	....
April	1,200	.64	2,670	1.42	....	....	....	....
May	6,900	3.67	14,000	7.45	41,600	6.30	48,700	7.38
June	4,820	2.56	4,940	2.63	14,100	2.14	14,180	2.15
July	3,630	1.93	1,630	.87	8,560	1.30	6,560	.99
August	3,220	1.71	516	.28	6,850	1.04	4,150	.63
September	2,030	1.08	266	.14	4,240	.64	2,480	.38
October	2,040	1.09	1,590	.84	8,230	1.25	7,780	1.18
November	2,060	1.10	1,800	.96	11,000	1.67	10,740	1.63
December	2,030	1.08	1,000	.53	....	....	....	....

Effect of storage of water on West Branch of Penobscot River above Millinocket on flow at Millinocket and at West Enfield—Continued.

Month.	Discharge at Millinocket.				Discharge at West Enfield.			
	As observed.		As corrected for storage.		As observed.		As corrected for storage.	
	Second-feet.	Second-feet per square mile of drainage area.	Second-feet.	Second-feet per square mile of drainage area.	Second-feet.	Second-feet per square mile of drainage area.	Second-feet.	Second-feet per square mile of drainage area.
1907.								
January					6,820	1.03		
February					3,960	.60		
March	380	0.20	396	0.21	2,930	.44	2,950	0.45
April					17,600	2.67		
May	7,060	3.76	16,200	8.61	40,200	6.10	49,340	7.48
June	6,930	3.69	6,490	3.45	19,900	3.02	19,460	2.95
July	5,210	2.77	6,080	3.24	17,600	2.67	18,470	2.80
August	3,480	1.85	3,000	1.60	10,800	1.64	10,320	1.56
September	2,140	1.14	1,610	.86	7,580	1.15	7,050	1.07
October					10,100	1.53		
November					22,400	3.39		
December	4,510	2.40	3,580	1.91	16,800	2.55	15,870	2.40
1908.								
January	3,130	1.66	2,420	1.29	11,300	1.71	10,590	1.60
February	2,860	1.52	1,620	.86	10,400	1.58	9,160	1.39
March	2,990	1.59	1,520	.81	11,200	1.70	9,730	1.47
April	2,930	1.56	4,030	2.14	22,600	3.42	23,700	3.59
May	10,200	5.43	15,800	8.40	39,400	5.97	45,000	6.82
June	6,910	3.68	6,420	3.41	17,800	2.70	17,310	2.62
July	3,790	2.02	1,420	.76	7,900	1.20	5,530	.84
August	2,490	1.32	1,020	.54	6,000	.91	4,530	.69
September	2.000	1.06	250	.13	4,220	.64	2,470	.37
October	2,000	1.06	310	.17	3,450	.52	1,760	.27
November	2,000	1.06	240	.13	4,040	.61	2,280	.35
December	2,000	1.06	330	.18	3,960	.60	2,290	.36
1909.								
January	1,390	.74	810	.43	8,930	1.35	8,350	1.27
February	813	.43	750	.40	8,170	1.24	8,110	1.23
March	1,360	.72	1,060	.56	10,000	1.52	9,700	1.47
April	2,440	1.30	8,250	4.39	43,000	6.52	48,800	7.40
May	9,340	4.96	15,200	8.10	38,700	5.86	44,550	6.75
June	4,630	2.46	3,600	1.92	13,100	1.98	12,070	1.83
July	3,310	1.76	2,300	1.22	8,520	1.29	7,510	1.14
August	2,320	1.23	930	.50	5,110	.77	3,720	.56
September	2,270	1.21	1,940	1.03	10,600	1.61	10,270	1.55
October	2,330	1.24	4,240	2.26	15,500	2.35	17,410	2.64
November	2,210	1.18	2,570	1.37	11,400	1.73	11,760	1.78
December	2,190	1.16	1,910	1.02	9,680	1.47	9,400	1.42
1910.								
January	2,130	1.14	1,430	.76	7,400	1.12	6,700	1.01
February	4,070	2.16	1,620	,86	8,600	1.30	6,150	.93
March	4,050	2.16	1,450	.77	11,800	1.78	9,200	1.39
April	2,510	1.34	9,320	4.96	27.800	4.19	34,600	5.24
May	5,700	3.03	6,320	3.36	19,800	2.99	20,400	3.09
June	5,380	2.86	4,800	2.56	16,800	2.53	16,200	2.45
July	2,850	1,52	2,240	1.19	8,380	1.26	7,770	1.18
August	2,300	1.23	1,050	.56	6,140	.93	4,890	.74
September	2,350	1.25	400	.21	4,260	.64	2,310	.35
October	2,210	1.18	350	.19	3,370	.51	1,510	.23
November	2,150	1.14	1,050	.58	4,070	.61	2,970	.45
December	2,140	1.14	650	.35	4,000	.60	2,510	.38

The table clearly shows the effect of the present storage above Millinocket. It is especially noticeable during the fall months of the dry years—1903, 1905, 1906, 1908, and 1910—when the flow past Millinocket formed a large part of the total flow at West Enfield, and the effect would be even better shown if data of discharge were available at West Enfield for the winter months following and during these periods of drought.

The storage of water for log driving on the East Branch, the Mattawamkeag, and a few other tributaries has no lasting effect on the regimen of flow, but this temporary storage serves to lessen the tendency to high water during the spring and to maintain rather more than the normal river stage during April, May, and June on the smaller streams, and perhaps through July on the large tributaries.

WATER AVAILABLE ON WEST BRANCH OF PENOBSCOT RIVER.

MASS CURVE FOR WEST BRANCH AT MILLINOCKET.

The estimated monthly discharge at Millinocket, corrected for storage, as given in the previous table, has been used in investigating the amount of water available for storage on the West Branch.

The method used is that of the mass curve, described in the report on the water resources of the Kennebec River basin.[1]

The base data for this mass curve are embodied in the following table.

Column 2 shows the mean monthly discharge of the West Branch of Penobscot River at Millinocket, corrected for storage, as previously explained; column 3 indicates the surplus (+) or deficit (−) of the discharge figures in column 2, relative to an assumed constant discharge of 2,500 second-feet at Millinocket; column 4 is the equivalent of column 3 expressed in billions of cubic feet; and column 5 shows the total surplus water, in billions of cubic feet, available for storage during any given month, beginning with January, 1901, under the assumption of 2,500 second-feet minimum flow, and the values are obtained by adding or subtracting, respectively, the surplus or deficit shown in column 4. The values in this column are used in plotting the "mass curve" (Pl. X).

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[1] Water-Supply Paper U. S. Geol. Survey No. 198, pp. 150-153.

Mass curve for Millinocket.

Month.	Discharge of West Branch of Penobscot River at Millinocket, corrected for storage.	Surplus (+) or deficit (−) for a discharge of 2,500 second-feet at Millinocket.		Water available for storage.
		Second-feet.	Billion cubic feet.	
	Second-feet.			*Billion cubic feet.*
1901.				
January	800	− 1,700	− 4.55	− 4.55
February	842	− 1,658	− 4.01	− 8.56
March	727	− 1,773	− 4.75	−13.31
April	12,300	+ 9,800	+25.40	+12.09
May	8,160	+ 5,660	+15.16	27.25
June	2,400	− 100	− .26	26.99
July	1,400	− 1,100	− 2.94	24.05
August	1,840	− 660	− 1.77	22.28
September	707	− 1,793	− 4.65	17.63
October	410	− 2,090	− 5.60	12.03
November	640	− 1,860	− 4.82	7.21
December	3,140	+ 640	+ 1.71	8.92
1902.				
January	2,600	+ 100	+ .27	9.19
February	2,160	− 340	− .82	8.37
March	4,680	+ 2,180	+ 5.84	14.21
April	14,600	+12,100	+31.36	45.57
May	10,200	+ 7,700	+20.62	66.19
June	9,400	+ 6,900	+17.88	84.07
July	860	− 1,640	− 4.39	79.68
August	1,150	− 1,350	− 3.62	76.06
September	1,400	− 1,100	− 2.85	73.21
October	2,980	+ 480	+ 1.29	74.50
November	3,700	+ 1,200	+ 3.11	77.61
December	2,300	− 200	− .54	77.07
1903.				
January	951	− 1,549	− 4.15	72.92
February	872	− 1,628	− 3.94	68.98
March	5,140	+ 2,640	+ 7.07	76.05
April	17,200	+14,700	+38.10	114.15
May	8,290	+ 5,790	+15.51	129.66
June	1,600	− 900	− 2.33	127.33
July	871	− 1,629	− 4.36	122.97
August	1,270	− 1,230	− 3.29	119.68
September	110	− 2,390	− 6.19	113.49
October	238	− 2,262	− 6.06	107.43
November	413	− 2,087	− 5.41	102.02
December	502	− 1,998	− 5.35	96.67
1904.				
January	344	− 2,156	− 5.77	90.90
February	304	− 2,196	− 5.50	85.40
March	449	− 2,051	− 5.49	79.91
April	2,860	+ 360	+ .93	80.84
May	12,300	+ 9,800	+26.24	107.08
June	2,910	+ 410	+ 1.06	108.14
July	1,450	− 1,050	− 2.81	105.33
August	1,110	− 1,390	− 3.72	101.61
September	2,060	− 440	− 1.14	100.47
October	4,310	+ 1,810	+ 4.85	105.32
November	1,810	− 690	− 1.79	103.53
December	740	− 1,760	− 4.71	98.82
1905.				
January	700	− 1,800	− 4.82	94.00
February	342	− 2,158	− 5.22	88.78
March	370	− 2,130	− 5.70	83.08
April	5,910	+ 3,410	+ 8.84	91.92
May	8,700	+ 6,200	+16.60	108.52
June	3,900	+ 1,400	+ 3.63	112.15
July	1,630	− 870	− 2.33	109.82
August	330	− 2,170	− 5.81	104.01
September	100	− 2,400	− 6.22	97.79
October	100	− 2,400	− 6.43	91.36
November	294	− 2,206	− 5.72	85.64
December	278	− 2,222	− 5.95	79.69

Mass curve for Millinocket—Continued.

Month.	Discharge of West Branch of Penobscot River at Millinocket, corrected for storage.	Surplus (+) or deficit (−) for a discharge of 2,500 second-feet at Millinocket.		Water available for storage.
		Second-feet.	Billion cubic feet.	
1906.	*Second-feet.*			*Billion cubic feet.*
January	436	− 2,064	− 5.53	74.16
February	740	− 1,760	− 4.26	69.90
March	713	− 1,787	− 4.79	65.11
April	2,670	+ 170	+ .44	65.55
May	14,000	+11,500	+30.80	96.35
June	4,940	+ 2,440	+ 6.32	102.67
July	1,630	− 870	− 2.33	100.34
August	516	− 1,984	− 5.31	95.03
September	266	− 2,234	− 5.79	89.24
October	1,590	− 910	− 2.44	86.80
November	1,800	− 700	− 1.81	84.99
December	1,000	− 1,500	− 4.02	80.97
1907.				
January	1,260	− 1,240	− 3.32	77.65
February	571	− 1,929	− 4.67	72.98
March	396	− 2,104	− 5.63	67.35
April	2,860	+ 360	+ .93	68.28
May	16,200	+13,700	+36.69	104.97
June	6,490	+ 3,990	+10.34	115.31
July	6,080	+ 3,580	+ 9.59	124.90
August	3,000	+ 500	+ 1.34	126.24
September	1,610	− 890	− 2.31	123.93
October	2,880	+ 380	+ 1.02	124.95
November	6,970	+ 4,470	+11.59	136.54
December	3,580	+ 1,080	+ 2.89	139.43
1908.				
January	2,420	− 80	− .20	139.23
February	1,620	− 880	− 2.21	137.02
March	1,520	− 980	− 2.62	134.40
April	4,030	+ 1,530	+ 3.97	138.37
May	15,800	+13,300	+35.62	173.99
June	6,420	+ 3,920	+10.16	184.15
July	1,420	− 1,080	− 2.89	181.26
August	1,020	− 1,480	− 3.96	177.30
September	250	− 2,250	− 5.83	171.47
October	310	− 2,190	− 5.86	165.61
November	240	− 2,260	− 5.86	159.75
December	330	− 2,170	− 5.81	153.94
1909.				
January	810	− 1,690	− 4.53	149.41
February	750	− 1,750	− 4.23	145.18
March	1,060	− 1,440	− 3.86	141.32
April	8,250	+ 5,750	+14.90	156.22
May	15,200	+12,700	+34.01	190.23
June	3,600	+ 1,100	+ 2.85	193.08
July	2,300	− 200	− .54	192.54
August	930	− 1,570	− 4.20	188.34
September	1,940	− 560	− 1.45	186.89
October	4,240	+ 1,740	+ 4.66	191.55
November	2,570	+ 70	+ .18	191.73
December	1,910	− 590	− 1.58	190.15
1910.				
January	1,430	− 1,070	− 2.87	187.28
February	1,620	− 880	− 2.13	185.15
March	1,450	− 1,050	− 2.81	182,34
April	9,320	+ 6,820	+17.67	200.01
May	6,320	+ 3,820	+10.22	210,23
June	4,800	+ 2,300	+ 5.96	216.19
July	2,240	− 260	− .70	215.49
August	1,050	− 1,450	− 3.88	211.61
September	400	− 2,100	− 5.44	206.17
October	350	− 2,150	− 5.76	200.41
November	1,050	− 1,450	− 3.76	196.65
December	650	− 1,850	− 4.95	191.70

Plate X shows a "mass diagram" for the period embraced by the Millinocket records (1901–1909) made up from the foregoing table by plotting the values given in column 5 as ordinates and the time in months as abscissas. Plate X was engraved before the data for 1910 in the foregoing table were available. The features of this diagram of especial importance are as follows:

1. For the interval of time between any two dates represented on the axis of abscissas, the surplus or deficiency is obtained by subtracting the ordinate corresponding to the earlier date from the ordinate corresponding to the later date; if this difference is positive it represents a surplus; if it is negative it represents a deficiency. An ascending part of the curve, therefore, shows a period during which the quantity of available water is increasing, and a descending part of the curve indicates a period in which the quantity of available water is decreasing.
2. The crests and hollows of the curve indicate those instants of time when supply and demand are equal.
3. If a horizontal line is drawn from any of the low points of the curve back to a rising line, the maximum ordinate scaled from the horizontal line to the curve will show the amount in billions of cubic feet that would have to be stored to provide the assumed flow during the period of drought covered by the horizontal line.
4. The period during which this greatest ordinate occurs is therefore the critical one, and all the surplus of supply over demand during parts of this period must be stored to meet the deficiency during the remainder of it.

Plate X shows that the period which includes the maximum ordinate extends from about May, 1902, to March, 1906, and that the maximum ordinate falls in May, 1903. This maximum ordinate (A–B, Pl. X) corresponds to 64.55 billion cubic feet, which is the amount of storage required to provide at all times from May, 1903, to March, 1906, a minimum flow of 2,500 second-feet at Millinocket.

The effect of modifying the assumed conditions of minimum flow at Millinocket is obtained by means of the intercepts of the dotted lines radiating from the various low points in the mass curve (C, D, and E, Pl. X), measured upon the vertical ordinate A–B, with regard to point A.

Thus, for an assumed minimum flow of 2,400 second-feet at Millinocket, the line D F is drawn at a slope with the horizontal corresponding to a continuous discharge of 100 second-feet, so that F B represents 8.94 billion cubic feet (the equivalent of 100 second-feet for the 34-month period between B and D, or May, 1903, to March, 1906). The storage required to produce a minimum flow of 2,400 second-feet will therefore be 8.94 billion cubic feet less than the 64.55 billion cubic feet required for a minimum flow of 2,500 second-feet, or 55.61 billion cubic feet, or the distance A–F.

The dotted line marked 2,265 passes through the point C, and for values of minimum flow less than 2,265 second-feet the sloping lines will start from point C and the period during which storage is being utilized is the 10 months from May, 1903, to March, 1904. The ordinates of required storage are measured on the line A B until the point G is reached, corresponding to a minimum flow of 1,238 second-feet, the ordinate A–G being equal to the ordinate H–M. Below a minimum flow of 1,238 second-feet the ordinates of required storage are measured from H on the line H M.

For a minimum flow greater than 2,500 second-feet the ordinates of required storage are greater than A B and are defined by the slanting lines 2,600, 2,700, etc. It will be noted that the line marked 2,571 passes through D and E, and for minimum flow greater than 2,571 the dotted lines radiate from E, corresponding to a time of 46 months (March, 1903, to March, 1907), during which water stored prior to March, 1903, will be used.

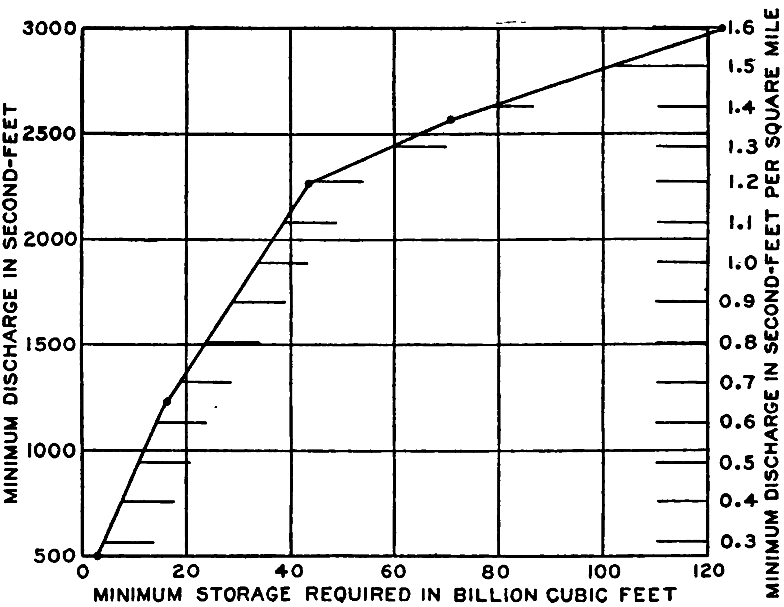


FIGURE 5.—Minimum discharge of West Branch of Penobscot River at Millinocket for given storage in billion cubic feet.

The probable upper limit of storage is indicated by the average discharge at Millinocket during the period 1901–1909, inclusive, which was 3,160 second-feet, or 1.68 second-feet per square mile of drainage. It seems best to set the limit somewhat below this figure and therefore 1.60 second-feet per square mile of drainage (or about 3,000 second-feet at Millinocket) will be assumed as the limiting quantity of water to be considered in these storage investigations.

In the following table are given in condensed form the results from the mass curve (Pl. X), showing the amounts of storage required to give various minimum discharges at Millinocket:

Storage required for different minimum discharges at Millinocket.

[Drainage area, 1,880 square miles.]

Discharge at Millinocket.		Storage required.
Second-feet.	Second-feet per square mile.	Billion cubic feet.
500	0.27	3.00
1,000	.53	12.17
1,238	.66	16.45
1,500	.80	23.46
2,000	1.06	36.61
2,265	1.20	43.58
2,500	1.33	64.55
2,571	1.37	70.90
3,000	1.60	122.88

This is also shown more completely, in graphic form, in figure 5, where values of necessary storage in billion cobic feet are plotted as abscissas and values of minimum discharge at Millinocket as ordinates. The latter values are also shown as second-feet per square mile of drainage by means of an auxiliary scale at the right of the figure.

APPLICATION OF RESULTS OF MASS-CURVE COMPUTATION.

To render the results of the mass-curve computations, as shown in figure 5, applicable for drainage areas adjacent to that of the West Branch of the Penobscot at Millinocket, the following table has been prepared, in which the minimum discharge is expressed as second-feet per square mile of drainage area and the required storage in billion cubic feet per 100 square miles of drainage area.

Storage required to produce various discharges, based on the records of West Branch at Millinocket.

Discharge.	Recorded storage at Millinocket.	Required storage per 100 square miles of drainage area.
Sec.-ft. per sq. mile.	*Billion cu. ft.*	*Billion cu. ft.*
0.3	4.17	0.222
.4	7.59	.404
.5	11.0	.586
.6	14.5	.771
.66	16.4	.874
.7	18.5	.984
.8	23.5	1.25
.9	28.4	1.51
1.0	33.4	1.78
1.1	38.4	2.04
1.2	43.3	2.31
1.3	59.6	3.17
1.37	70.9	3.77
1.4	78.3	4.17
1.5	101.1	5.38
1.6	123.8	6.58

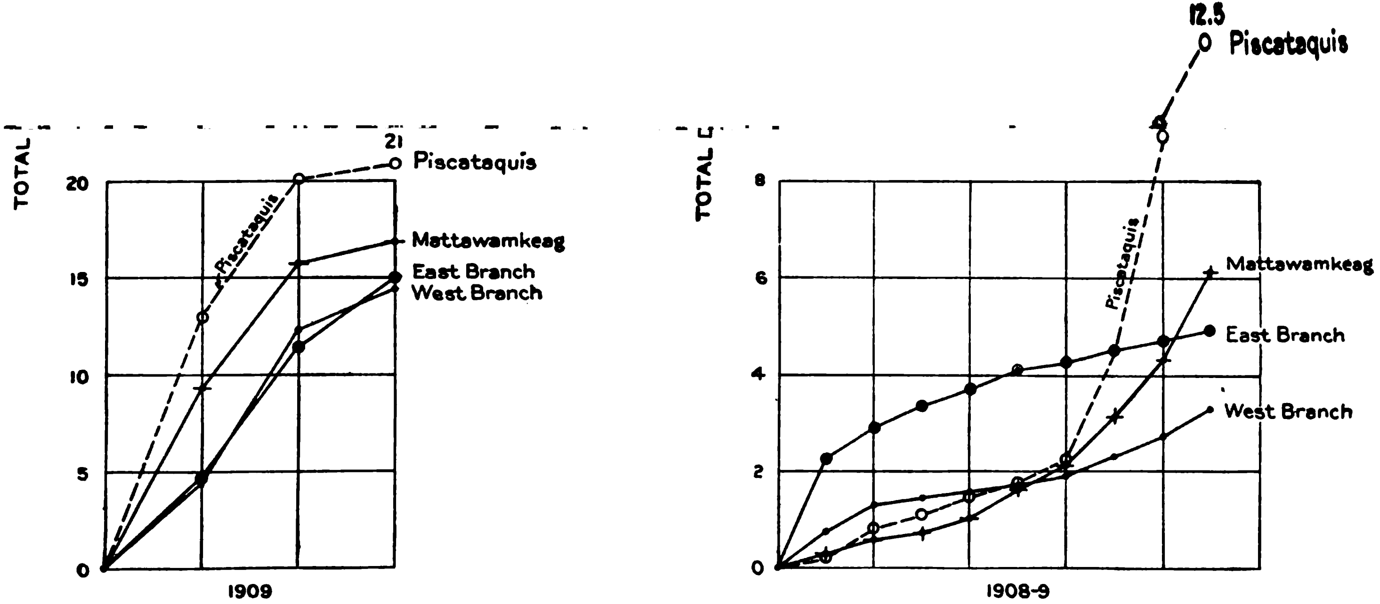
WATER AVAILABLE ON OTHER TRIBUTARIES OF PENOBSCOT RIVER.

The relative yield of other tributaries of the Penobscot as compared with that of the West Branch at Millinocket, covering the years 1906–1909 for the Mattawamkeag at Mattawamkeag, the East Branch at Grindstone, and the Piscataquis at Foxcroft, is shown on Plate XI. The years 1906–1909 have been selected because they constitute the only years of complete records of discharge. On this plate each year has been considered in two portions, one including the months April to June, inclusive, which are generally the months when most of the water is available for storage, and the second portion the months July to March, inclusive, which in this latitude are generally months when stored water would have to be utilized.

All the diagrams on Plate XI are mass curves showing the total discharge in second-feet per square mile of drainage area per month, all curves being assumed to start at the same point, at the beginning of the period in question, and the relative position of the curves at any time indicating the relative total discharge of these different tributaries up to that time.

Comparing these results, first for the period April to June, inclusive, it will be noted that the mass curves for the West Branch, East Branch, and Mattawamkeag are in general similar, and the total amount of water available for storage on these different rivers is about the same. In general the discharge of the Mattawamkeag is slightly greater than that of the East Branch, the latter slightly exceeding that of the West Branch. This is in accordance with the relative amounts of precipitation on the drainage areas of these branches. It must be kept in mind that the run-off during April and May usually includes the greater part of the precipitation stored in the form of snow, beginning about the middle of November.

The record shows a considerably higher discharge for the Piscataquis than for the other tributaries, partly because the gaging station is much nearer the source of the river than are the gaging stations on the other tributaries. The precipitation on the upper part of the Piscataquis basin is undoubtedly considerably greater than the mean precipitation on the whole basin, and the unit discharge at Foxcroft is correspondingly greater than at the mouth of the Piscataquis. The records for the Foxcroft gaging station are probably not as reliable as those for the other tributaries, on account of the variable use of water at the mills above Foxcroft, and the estimates of flow during the winter months at Foxcroft are probably subject to considerable error. Hence, though it may be inferred that the



PERIOD DURING WHICH WATER IS GENERALLY AVAILABLE FOR STORAGE

PERIOD DURING WHICH STORED WATER MUST GENERALLY BE UTILIZED

DIAGRAM SHOWING STORAGE MASS OF SEVERAL TRIBUTARIES OF PENOBSCOT RIVER.

Discharge for West Branch of the Penobscot has been corrected for storage; other figures are as observed.

unit discharge of the Piscataquis at Foxcroft is greater than that of the other tributaries of the Penobscot here considered, it is probable that the results shown by the mass curves (Pl. XI) are somewhat too large.

The July to March curves for the three seasons considered on Plate XI indicate that the discharge in 1907–8 was considerably above the normal, the other two seasons being characterized as drier. During July of each year the flow of the East Branch is liable to be somewhat affected by storage, but it will be noted that after July the East and West branches show very similar discharge until the following April.

The discharge of the Mattawamkeag is also similar to that of the East and West branches for the summer and fall months, but from November of each year it shows a well-defined tendency toward increase, doubtless owing to the fact that the Mattawamkeag drainage basin lies relatively nearer the coast and farther east than the areas drained by other tributaries, so that occasional winter thaws contribute to the run-off. The Mattawamkeag is therefore less subject to the low-water stages during January and February than the other rivers—an important factor in the storage problem, for it will be noted that these winter months frequently show very low discharge rates on the East and West branches of the Penobscot and thus materially extend the time required for using stored water. (See Pl. XI.)

The Piscataquis curve shows a slightly greater discharge rate than is shown by the curves for the other tributaries during the summer months, considerable more during the fall, and very much more during the winter. The explanation is in part indicated on page 200.

The relative yield of the four tributaries may be summarized as follows:

The amount of water generally available for storage from April to June, inclusive, is slightly greater on the East Branch and Mattawamkeag than on the West Branch, and is probably still greater on the Piscataquis, so that the upper limit of storage corresponding to a unit discharge of 1.60 second-feet per square mile of drainage, as used in the table on page 199, is conservative for all these tributaries.

For the part of the year when storage must generally be utilized, July to March, inclusive, the East and West branches are substantially alike in regimen, and the table, page 199, is applicable to either drainage area. For the Mattawamkeag this table is conservative, and somewhat less storage would be required to produce the various assumed discharges, especially the lower ones.

For the Piscataquis above Foxcroft this table is very conservative, but as most of the available storage in the Piscataquis drainage is in the lakes northeast of Foxcroft and adjacent to the West Branch drainage area, the table is fairly well applicable for these storage sites.

WATER AVAILABLE FROM STORAGE.

The table on page 199 affords a basis for the following estimates of discharge probably available from the various storage reservoirs:

Discharge available from storage reservoirs on West Branch of Penobscot River.

Twin Lake system.

[Drainage area, 1,880 square miles.]

Elevation of water surface above Bangor and Aroostook datum (feet).	Total storage capacity (cubic feet) above elevation 469 feet.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
487	11,410,000,000	0.51	960	Crest of spillway, present dam.
489	12,800,000,000	.55	1,030	
491	14,190,000,000	.59	1,110	
492	14,880,000,000	.61	1,140	Top of flashboards, present dam (highest level of lake).

Ripogenus Lake.

[Drainage area, 1,410 square miles.]

Elevation of water surface above sea level (feet).	Total storage capacity (cubic feet) above elevation 879 feet.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
889	301,100,000	....	....	Crest of present dam.
930.6	21,600,000,000±	0.91±	1,310±	Crest of proposed dam, which will include Chesuncook Lake.

Chesuncook Lake.

[Drainage area, 1,330 square miles.]

Elevation of water surface above Bangor and Aroostook datum (feet).	Total storage capacity (cubic feet) above elevation 913.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
933	13,600,000,000	0.72	958	Crest of spillway, present dam.
935	15,600,000,000	.77	1,024	
937	17,600,000,000	.83	1,104	See Ripogenus Lake, above.

Discharge available from storage reservoirs on West Branch of Penobscot River—Contd.

Caucomgomuc Lake.

[Drainage area, 174 square miles.]

Elevation of water surface above sill of present dam (feet).	Total storage capacity (cubic feet) above sill of dam.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
0	....	....	....	Sill of present dam.
5	800,100.000	0.43	75	
8	1,358,000,000	.61	106	Crest of present dam.
10	1,760,600,000	.71	124	
15	2,872,800,000	.95	165	

Summary for West Branch of Penobscot River.

Lake.	Discharge available with present storage.	Discharge available with additional storage.
	Second-feet.	*Second-feet.*
Twin Lake system	1,140	1,140
Ripogenus and Chesuncook lakes	958	1,310±
Caucomgomuc	106	165
	2,204	2,615
Total second-feet per square mile at outlet of Twin Lakes system	1.17	1.39

Even with the additional storage indicated above the West Branch would not be developed to the limit of 1.60 second-feet per square mile, and would still be capable of utilizing more storage capacity.

Discharge available from storage reservoirs on East Branch of Penobscot River.

Grand and Second Grand lakes.

[Drainage area, 496 square miles.]

Elevation of water surface above sea level (feet).	Total storage capacity (cubic feet) above elevation 641.2.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
645	407,900,000	....	....	Ordinary low water.
650	1,104,900,000	0.30	149	
655	1,959,000,000	.40	199	Crest of present dam.
660	2,949,900,000	.51	253	
665	4,056,700,000	.63	313	
670	5,277,800,000	.73	363	

Discharge available from storage reservoirs on East Branch of Penobscot River—Contd.

Chamberlain and Telos lakes and Round Pond.

[Drainage area, 270 square miles.]

Elevation of water surface above sea level (feet).	Total storage capacity (cubic feet) above elevation 935.4.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
937.9	1,261,000,000	0.43	116	Ordinary low water.
942.9	3,991,000,000	.89	240	
945.8	5,729,000,000	1.13	305	Crest of present Lock Dam.
947.9	6,973,000,000	1.23	332	10 feet above ordinary low water.
952.9	10,173,000,000	1.37	370	
957.9	13,743,000,000	1.48	400	20 feet above ordinary low water.
962.9	17,804,000,000	1.6	432	Limit of desirable storage.

Allagash Lake.

[Drainage area, 102 square miles.]

Elevation of water surface above sea level (feet).	Total storage capacity (cubic feet) above elevation 1,037.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
1,041.5	835,500,000	0.63	64	Ordinary low water.
1,044	1,320,000,000	.81	83	Crest of present dam.
1,051.5	2,844,400,000	1.25	127	10 feet above ordinary low water.
1,061.5	5,020,400,000	1.45	148	20 feet above ordinary low water.
1,068.9	6,710,000,000	1.60	163	Limit of desirable storage.

Summary for East Branch of Penobscot River.

Lake.	Discharge available with present storage.	Discharge available with additional storage.
	Second-feet.	*Second-feet.*
Grand and Second Grand	199	363
Chamberlain and Telos and Round Pond	305	432
Allagash	84	163
	588	[a] 795
Total second-feet per square mile at outlet of Grand Lake	1.19	1.60

[a] Omitting Allagash Lake, as entire drainage area will be required for Chamberlain Lake.

The discharge indicated in the summary above would include complete development of the East Branch above Grand Lake outlet to a discharge of not less than 1.60 second-feet per square mile, or the practical limit of available water.

Discharge available from storage reservoirs on Mattawamkeag River.

Baskahegan Lake.

[Drainage area, 151 square miles.]

Elevation of water surface above crest of present dam (feet).	Total storage capacity (cubic feet) above elevation of present gate sills.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
0	2,468,000,000	0.95	143	Crest of present dam.
5	5,033,000,000	1.32	199	
10	8,058,000,000	1.50	227	
12.8	9,950,000,000	1.60	242	Limit of desirable storage.

Mattawamkeag Lake.

[Drainage area, 305 square miles.]

Elevation of water surface above sea level (feet).	Total storage capacity (cubic feet) above elevation 455.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
455	....	....	....	Gate sills, present dam.
457	262,600,000	....	....	
460	694,200,000	0.30	91	
462	1,004,200,000	.36	110	
464	1,331,500,000	.42	128	Crest of present dam.
465	1,501,600,000	.45	137	Probable limit due to excessive damage.

Pleasant Lake.

[Drainage area possibly tributary, 79 square miles.]

Elevation of water surface above sea level (feet).	Total storage capacity (cubic feet) above elevation 595.	Minimum discharge available from this storage.		Remarks
		Second-feet per square mile.	Second-feet.	
595	....	....	....	Proposed elevation of outlet; to be obtained by dredging.
598	179,000,000	0.30	23.7	Present elevation of outlet.
600	303,900,000	.39	30.8	
602.5	464,900,000	.50	39.5	
605	630,800,000	.62	49.0	
607.5	802,300,000	.72	59.0	Probable limit of high water without excessive expense for dam, etc.
610	977,900,000	.80	63.0	
620	1,716,700,000	1.15	91.0	

Discharge available from storage reservoirs on Mattawamkeag River—Continued.

Summary for Mattawamkeag River.

Lake.	Discharge available with present storage.	Discharge available with additional storage.
	Second-feet.	*Second-feet.*
Baskahegan	143	242
Mattawamkeag	128	137
Pleasant Lake		59
	271	438
Total second-feet per square mile for 535 square miles total drainage area	0.51	0.82

Discharge available from reservoirs on Piscataquis River.

Schoodic Lake.

[Drainage area, 32 square miles.]

Elevation of water surface above sea level (feet).	Total storage capacity (cubic feet) above elevation 428.5.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
428.5				Probable elevation of outlet.
430	447,500,000	0.86	28	
432.5	1,202,300,000	1.37	43	Probable present limit of storage.
435	1,969,000,000	1.56	50	Probable limit of storage on account of damage.
435.4	2,110,000,000	1.60	51	Probable limit of storage on account of lack of drainage area.

Seboeis Lake and Northwest Pond.

[Drainage area, 49 square miles.]

Elevation of water surface above sea level (feet).	Total storage capacity (cubic feet) above elevation 432.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
432				Probable elevation of outlet.
432.5	78,900,000	0.22	11	
435	483,800,000	.70	34	
437.5	906,200,000	1.03	50	
440	1,345,300,000	1.27	62	Probable present limit of storage.
442.5	1,799,700,000	1.36	67	
445	2,268,100,000	1.44	71	Limit of storage on account of excessive damage.

Discharge available from reservoirs on Piscataquis River—Continued.

Endless Lake.

[Drainage area, 66 square miles.]

Elevation of water surface above sea level (feet).	Total storage capacity (cubic feet) above elevation 392.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
392	....	....	....	Sill of present dam.
395	168,100,000	0.32	21	
397.5	326,300,000	.45	30	
400	499,100,000	.59	39	Crest of present dam.
402.5	684,500,000	.72	48	
405	881,000,000	.83	55	
407.5	1,088,700,000	.95	63	
410	1,306,200,000	1.08	71	

Sebec Lake.

[Drainage area, 367 square miles.]

Elevation of water surface above sea level (feet).	Total storage capacity (cubic feet) above sill of dam.	Minimum discharge available from this storage.		Remarks.
		Second-feet per square mile.	Second-feet.	
0	....	....	....	Sill of dam.
5	1,393,900,000	0.39	143	
8	2,240,300,000	.51	187	Top of wasteway.
10	2,809,000,000	.60	220	
12	3,381,100,000	.68	250	Top of gates.
15	4,245,100,000	.77	282	
17	4,824,900,000	.83	304	Probable limit of storage on account of excessive damage.

Summary for Piscataquis River.

Lake.	Discharge available with present storage.	Discharge available with additional storage.
	Second-feet.	*Second-feet.*
Schoodic	43	51
Seboeis	62	([a])
Endless	39	105
Sebec	250	304
	394	460
Total in second-feet per square mile for 465 square miles total drainage area	0.85	0.99

[a] Included in discharge for Endless Lake.

SUMMARY OF EFFECT OF STORAGE ON FLOW.

The foregoing tables of summaries, comprising the more important reservoir sites for which data are available, are especially striking when considered in respect to the minimum discharge that should be obtained with the present developed storage (about 49 billion cubic feet), and show that, even on the West Branch, with its splendid storage facilities, water is not used as it should be to obtain the best results for power development. On the West Branch this loss is occasioned by the use of water for log driving during the summer months; on the East Branch, the Mattawamkeag, the Piscataquis, and other smaller tributaries no effort is made to store water except for log driving, and as a rule the gates at the dams are opened when the driving season is completed and any remaining stored water is allowed to waste. The following table presents an estimate of minimum flow obtainable at West Enfield and points below on the main river by efficient operation of the storage basins. For the portions of the drainage area not included in the storage basins considered the run-off used is that for the minimum month, as given on pages 136–139.

Yield of the Penobscot River at West Enfield and points below with present and additional storage.

River and point.	Drainage area (square miles).	Minimum discharge in second-feet.			
		With present storage (total 49 billion cubic feet).		With additional storage (total 85 billion cubic feet).	
		Second-feet.	Second-feet per square mile.	Second-feet.	Second-feet per square mile.
West Branch:					
At Millinocket	1,800	2,204	1.17	2,615	1.39
Below Millinocket	220	37	.17	37	.17
	2,100	2,241	1.07	2,652	1.26
East Branch:					
At Grand Lake	496	588	1.19	795	1.60
Below Grand Lake	634	196	.31	196	.31
	1,130	784	.69	991	.88
Mattawamkeag:					
Stored	535	271	0.51	438	0.82
Remainder	965	68	.07	68	.07
	1,500	339	.23	506	.34
Piscataquis:					
Stored	465	394	0.85	460	0.99
Remainder	1,035	155	.15	155	.15
	1,500	549	.37	615	.41
Penobscot: Remainder above West Enfield	370	55	0.15	55	0.15
Total at West Enfield	6,600	3,968	.60	4,819	.73
Total near Oldtown, just below Sunkhaze Stream	7,210	[a] 4,059	.56	[1] 4,910	.68
Total at Bangor waterworks dam	7,720	[a] 4,136	.54	[1] 4,987	.64

[a] Assuming discharge from intermediate drainage at 0.15 second-foot per square mile.

The foregoing table covers a period of drought as severe as is likely to occur in the Penobscot drainage basin, as can be seen by comparing the storage-mass curve (Pl. X) with that for the Kennebec at Moosehead Lake.[1] The Kennebec curve covers the 14 years, 1893 to

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[1] See Water-Supply Paper U. S. Geol. Survey No. 198, Pl. VI.

1906, inclusive, and, like Plate X, shows that the period of most severe drought was 1903–4. The table indicates that if the present developed storage of 49 billion cubic feet were efficiently operated the discharge of the main river at and below West Enfield would never fall below a monthly mean discharge of about 4,000 second-feet, whereas it actually reached 2,260 second-feet in October, 1903. With additional storage, making a total of 85 billion cubic feet, the minimum discharge at West Enfield would be increased some 800 second-feet and would reach nearly 5,000 second-feet at the lower power sites on the river near Bangor, or about double the present extreme low-water flow.

Lessening amount of water used for log driving.—The quantity of water at present used in log driving is approximately estimated on page 213. The most serious waste occurs on the East Branch, where 2,000 to 3,000 second-feet are required for driving. On the West Branch 4,000 second-feet is used between Chesuncook and Ambejejus lakes. This water is not necessarily all lost, as the Twin Lakes system below will handle at least a portion of it.

Between the Twin Lakes outlet and the mouth of the West Branch, Quakish Lake and the large pond at the Dolby plant of the Great Northern Paper Co. enable the use without loss of any excess water used for driving during the daytime. Further, Millinocket Lake dam was reconstructed during 1909 epecially for the purpose of storing water for driving, and the stored water will be of especial help on the lower part of the West Branch.

Data in regard to water used for driving on the Mattawamkeag and Piscataquis are not available, but in a general way these tributaries are not so important for log driving as the East and West branches, nor are their facilities for storage so great at present.

Unquestionably much of the waste of water in driving can be eliminated, and that without a great burden of expense. The future demands for driving should not require any excess flow on the West Branch over that actually in use for power at Millinocket. On the East Branch the channel below Grand Lakes will require improvement. The development of some of the good power sites in this part of the river would be of much assistance in this respect. The main river can undoubtedly be driven with the quantities that would be contributed from the East and West branches and other tributaries under the improved regulation of storage. In considering this matter it must be kept in mind that the log-driving season is usually not a period of drought, so that the run-off in the table (p. 208) for parts of the drainage area not controlled by storage would be considerably greater than that estimated.

Effect of storage on navigation.—The navigable portion of the Penobscot, being entirely within tidal limits, the effect of regulating and increasing storage of water in the basin would not be of great importance except perhaps in the upper part of the river near Bangor.

The efficient use of the present available storage would, as has been shown, increase the extreme low-water flow of the river by some 1,800 second-feet. This would probably mean an increase in stage of between 1 and 2 feet at Bangor at low tide of a dry year, an increase which would be of considerable value to the large boats plying between Bangor and Boston.

With the increased storage the low-water discharge at Bangor would be some 2,800 second-feet greater than at present, which would raise the low-tide stage during the dry year perhaps 2 to 3 feet over the present height.

CONCLUSIONS.

The estimates of storage here presented are not necessarily final and may be changed in the light of later and more complete data, but they are based on the run-off of the West Branch during a series of very dry years and are believed to represent the practical extreme of low water to be expected on the Penobscot. The data for tributaries other than the West Branch are not as complete or as conclusive, and it is likely that the estimates are, if anything, too conservative for these portions of the drainage basin. The basin contains numerous storage sites that have not been investigated, and eventually the estimated amount of available additional storage can probably be greatly increased. This is especially true of the Mattawamkeag and Passadumkeag drainage basins, for which storage data are less complete than for the other tributaries. The Piscataquis above Sebec River may also afford one or more small reservoir sites. Some excellent opportunities have been indicated for obtaining additional storage with economy.

Of the 49 billion cubic feet of storage afforded by the dams in the Penobscot basin for which data are available, only about 30 billion cubic feet—that on the West Branch—is operated with any approach to efficiency as regards the use of water for power development, and even on the West Branch the predominance of the log-driving interests during certain months of the year causes considerable waste of water.

In the past log driving and lumbering have been of greatest importance, but the constantly growing power interests require a much more economical use of water than is necessary in log driving. The present dams should be kept tight and in good repair and care should be taken not to waste water either in log driving or by careless handling of gates. Systematic efforts should be made to keep all reservoirs as full and to retain the water as far upstream in the storage system as possible. Care in operation with even the present reservoir system would greatly increase the value of the power privileges, and the development of the additional storage sites described in this report would establish a minimum discharge limit that would make the Penobscot one of the best power streams in the United States.

LOG DRIVING AND LUMBERING.

NEED OF CONSERVING FORESTS.

Whether or not the forests of the country are being cut at a rate so rapid as to threaten their early extermination is a question that has gained serious recognition. Years ago white pine was abundant in the Maine forests; to-day comparatively little can be found, and it is believed that the practical exhaustion of the white pine in this State has had an important effect in directing public attention to a proper care of the remaining forests. Many large operators are endeavoring to acquire sufficient forest land to produce a yearly growth equivalent to their yearly requirements.

The cut of timber in the entire State of Maine in the winter of 1907–8 was about 725,000,000 feet board measure. Of this quantity about 230,000,000 feet were cut in the Penobscot basin. The principal commercial wood is now spruce, but hemlock and cedar are also cut.

METHOD OF DRIVING.

There are five principal "drives" in the Penobscot basin, namely, the West Branch, East Branch, Mattawamkeag, Piscataquis, and Passadumkeag. Some of these drives are united at certain points, others are independent from the starting point to the Penobscot boom, near Greenbush, where all drives are held up to be sorted.

Log-cutting operations are begun much earlier now than formerly. During August many men are in the woods building camps, swamping roads, and getting ready for the winter's cut, which is to be begun in the early fall. After the logs are cut they are "yarded" in convenient places, and when the snow comes they are hauled to the "landing," located on the shore of some tributary of the river down which they are ultimately to find their way. When the ice breaks up in the spring, the logs are rolled into the stream and float down on the high stage. In this way many small streams are driven which are almost dry after the first spring freshets. At the outlet of many of the ponds are dams which hold the spring waters back until the logs are ready, when, by a series of flushes, the logs are floated down the smaller streams to the larger stream below. If the first freshet fails to be of sufficient volume to flush the drive down stream, a part of it is held up and may have to remain over until the following spring.

After the drive is out of these small streams it is customary to allow the gates of dams at their headwaters to remain open until the next fall, so that during the summer their flow is natural.

The method used on the small streams is similar to that employed on the main river. On many streams, reservoirs are formed for the purpose of storing water to be used in carrying the main drive through the crooked and rocky sections and to float the logs over the otherwise shallow places. Chamberlain and Telos lakes, at the headwaters of the East Branch, form such a reservoir, nearly all of the stored water during the average year being used for the drive. Chesuncook Lake also was formerly used for this purpose, but power developments and improvements during the last few years have brought about a much more economical use of the water, although some of the water is still required for driving logs.

It is of interest to note that the largest operator on the Penobscot—the Great Northern Paper Co.—has employed during the winter of 1907–8 in the Penobscot Valley 2,700 men and more than 800 horses.

The location of the booms often mentioned in connection with the drives, is as follows: Penobscot boom begins at head of Hemlock Island and ends near Pea Cove; Great Northern Paper Co.'s boom, at North Twin Dam; Gellerson boom at Hainesville.

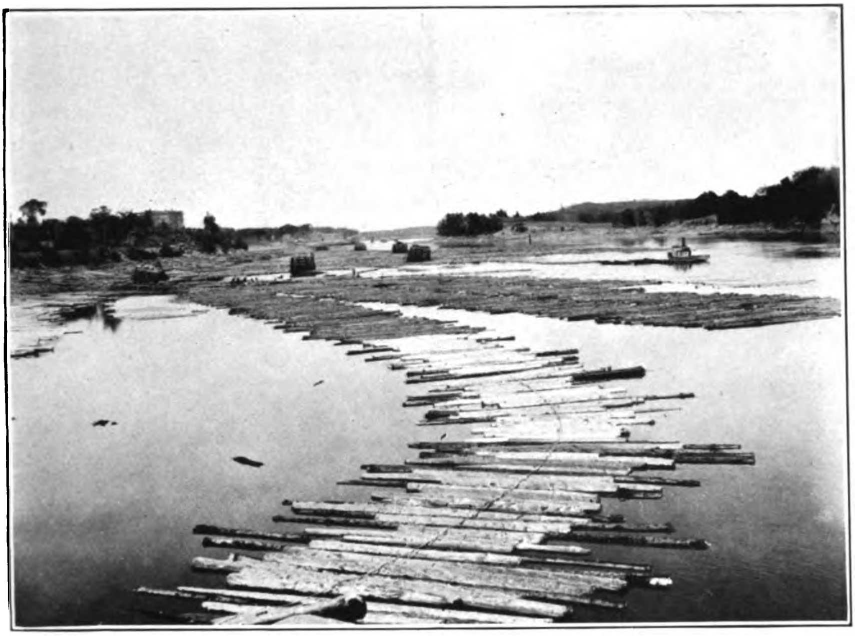
TIME OF DRIVING.

The different main drives are in general controlled by companies incorporated for the purpose and having certain powers from the State. The separate drives are usually "bid in" by some responsible person who has direct charge of operations.

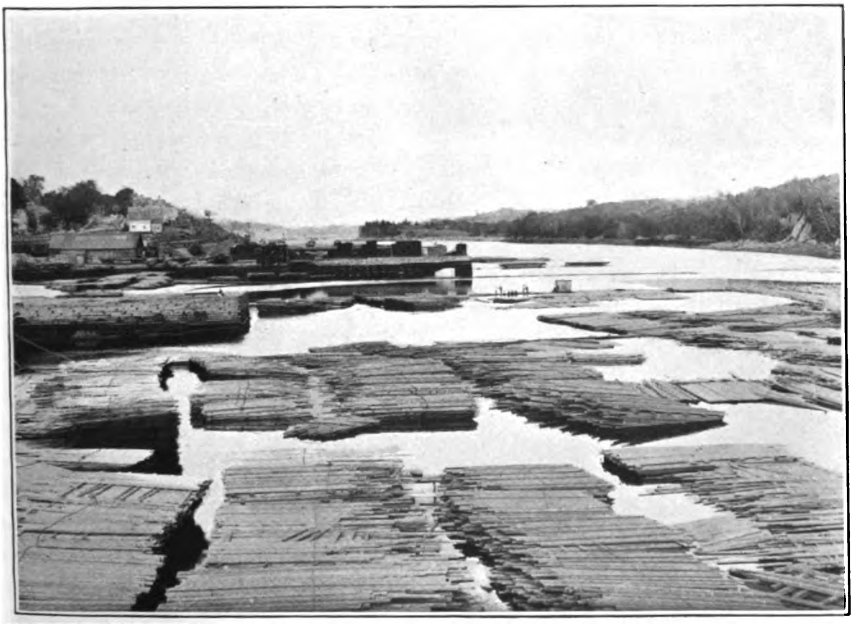
Previous to the 1903 drive, the Penobscot Log Driving Co. drove from the head of West Branch to Penobscot boom. Beginning with the drive of 1903, the West Branch Drive & Reservoir Dam Co., affiliated with the Great Northern Paper Co., took control, their lower limit being Shad Pond, where the Penobscot Log Driving Co. assumed control, driving to the Penobscot boom. By far the larger part of the West Branch drive is for the Great Northern Paper Co. and consequently does not go below Millinocket.

The West Branch drive leaves Chesuncook Lake sometime in June, arriving in Shad Pond on or about July 5 and at Penobscot boom about the 1st of September.

The East Branch Drive Co. drives the East Branch from Grand Lake. Ordinarily West Branch logs are held in Shad Pond until the East Branch drive passes into the main river, so that the two drives will not become mixed. At Lincoln the East Branch logs are sorted, and here the West Branch drive usually overtakes that from the East Branch so that both drives go into the Penobscot boom together, arriving there about the 1st of September.



A. LOGS AT TIDEWATER, READY FOR SHIPMENT.



B. LUMBER AT TIDEWATER, READY FOR SHIPMENT.

PENOBSCOT RIVER AT BANGOR.

The logs are sold in the Penobscot boom, whence they are driven to their destination (see Pl. XII).

As a rule the drives of the Mattawamkeag, Piscataquis, and Passadumkeag branches arrive in Penobscot boom sometime in June.

WATER USED IN DRIVING.

It is evident that the water is required for driving at just the time that it should be stored to meet the needs of power plants, and that more or less water is required for the drives during the greater part of the summer.

The following quantities of water are required to drive from Chesuncook Lake to the Penobscot boom:

From Chesuncook to Ambejejus, about 4,000 second-feet.

North Twin to Quakish, probably less than 3,000 second-feet. There is really no excess used in this distance, however, as day pitch of about 3,500 second-feet is used which is held at Quakish Lake and used through the wheels at Millinocket, about 2,500 second-feet being required here day and night.

From Quakish Lake to Shad Pond, about 3,500 second-feet.

It was customary for the Penobscot Log Driving Co. to require 4,000 second-feet from the time their drive left Shad Pond until it arrived below Medway, where the quantity was reduced to about 3,500 second-feet, water being taken from Millinocket Lake and an additional amount being furnished by the East Branch. It is probable that at the present time 3,000 second-feet, used in heads, together with the water supplied by East Branch and lower tributaries, will drive this part of the river.

The amount of water necessary to drive the East Branch is not definitely known, but it is probably between 2,000 and 3,000 second-feet. At the end of the average year the Chamberlain-Telos and Grand-Second Grand lakes storage reservoirs are drawn down to a very low stage, many years flowing with all gates up at the end of the driving season.

QUANTITIES OF LOGS DRIVEN AND COST OF DRIVING.

The following tables show the amount and cost of the principal drives for a series of years. Figures are given for the West Branch drive from 1898 to 1902, inclusive, covering the entire distance from the head of Chesuncook Lake to Penobscot boom. Since 1902 the drive above Shad Pond has been handled by a different company, and figures for this portion of the drive are not available after that date. It will be noticed that with the year 1903 there was an apparent falling off in the amount driven down West Branch. This is explained by the fact that beginning with 1903 the logs of the Great Northern Paper Co. have not entered Shad Pond.

The table relating to the West Branch from Shad Pond to Penobscot boom gives directly the tax per thousand or the charge per thousand made by the driving company against the owners of the logs. The tax per thousand is derived for the remaining tributaries from averages of the cost over the partial distances for which information is available.

Amount and cost of log driving on Penobscot River and tributaries.

Year.	Amount driven (thousand feet).	Cost.	Tax per thousand.
West Branch of Penobscot River from head of Chesuncook Lake to Penobscot boom.			
1898	22,406,330	$21,431.99	
1899	47,970,890	50,623.39	
1900	48,439,010	48,603.32	
1901	82,451,920	63,387.98	
1902	78,499,380	63,796.44	
West Branch of Penobscot River from Shad Pond to Penobscot boom.			
1903	27,026,000	$25,674.70	$0.95
1904	37,281,740	23,487.50	.63
1905	37,207,320	25,128.70	.68
1906	41,970,715	29,379.50	.70
1907	18,201,930	12,741.40	.70
1908	22,625,590	13,122.86	.58
1909	33,812,930	19,379.51	.58
1910	41,041,800	25,445.91	.62
West Branch of Penobscot River from Shad Pond to Dolby.			
1908	4,621,860	$462.19	$0.10
1909	30,000,000	3,600.00	.12
1910	7,849,180	941.90	.12
East Branch of Penobscot River from Grand Lake to Penobscot boom.			
1898	23,208,290	$9,496.88	
1899	37,796,810	21,246.45	
1900	37,010,810	18,789.34	
1901	40,952,230	25,570.82	
1902	40,461,920	30,199.07	
1903	42,444,200	31,996.36	
1904	72,908,580	61,161.11	
1905	44,859,460	45,918.04	
1906	61,299,690	40,179.02	
1907	46,149,700	54,244.36	
Mattawamkeag River from Gellerson boom to Penobscot boom.			
1903	14,095,490	$7,690.55	
1904	36,606,720	23,447.85	
1905	15,729,320	10,403.54	
1906	11,056,820	8,513.75	
1907	10,807,570	7,500.93	
1908	13,046,730	4,273.77	
1909	10,230,110	3,829.05	
1910	10,616,970	5,722,23	
1911	11,429,820	4,302.00	
Passadumkeag River from Nicatous Lake to Penobscot boom.			
1903	17,374,470	$10,399.17	
1904	20,534,459	15,643.93	
1905	7,696,755	4,614.23	
1906	14,254,370	6,654.75	
1907	13,186,760	6,056.88	

Amount and cost of log driving on Penobscot River and tributaries—Continued.

East Branch, tax for partial distances.

FROM GRAND LAKE DAM TO PENOBSCOT BOOM.

Year.	Amount driven (thousand feet).	Tax per thousand.	Remarks.
1898	12,671,930	$0.50	
1899	10,764,510	.64	First drive.
	10,237,060	.83	Second drive.
1900	3,844,911	.71	First drive.
	9,251,530	.78	Second drive.
1901	8,505,860	.79	First drive.
	9,262,850	.81	Second drive.
1902	3,306,150	.91	First drive.
	14,830,810	.91	Second drive.
1903	6,657,930	.79	First drive.
	22,845,900	.83¼	Second drive.
	3,265,600	.83¼	Rafted out in spring of 1904.
1904	12,196,930	.92½	First drive.
	30,928,510	.92½	Second drive.
	12,707,800	.92½	Rafted out in spring of 1905.
1905 [a]	9,608,520	1.38	
1906	24,528,840	.90	
	8,000,000	.90	Rafted out in spring of 1907.
1907	10,633,555	1.24	Second drive.
	13,381,420	1.37½	Third drive.
Average		.897	

FROM GRAND LAKE DAM TO LINCOLN.

Year.	Amount driven (thousand feet).	Tax per thousand.	Remarks.
1905	10,495,060	$1.18	
1906	13,076,320	.70	
1907	1,613,560	1.06	Second drive.
	3,348,760	1.19½	Third drive.
Average		1.034	

FROM HASKELL ROCK TO PENOBSCOT BOOM.

Year.	Amount driven (thousand feet).	Tax per thousand.	Remarks.
1899	1,071,400	$0.54	
1901	1,631,800	.71	
1905	1,088,960	1.21	
Average		.82	

FROM HULLING MACHINE TO PENOBSCOT BOOM.

Year.	Amount driven (thousand feet).	Tax per thousand.	Remarks.
1899	426,280	$0.44	
1900	1,073,890	.51	
1901	116,480	.63	
1902	1,692,250	.73	
Average		.578	

FROM SEBOEIS AND WASSATAQUOIK STREAMS TO LINCOLN.

Year.	Amount driven (thousand feet).	Tax per thousand.	Remarks.
1905	6,249,830	$0.78	
1906	1,514,000	.50	
1907	1,850,250	.70	
Average		.66	

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[a] Previous to 1905 the logs were driven from the various points up the river to Lincoln for the same price that they were driven from the corresponding points to the Penobscot boom.

Amount and cost of log driving on Penobscot River and tributaries—Continued.

East Branch, tax for partial distances—Continued.

FROM SEBOEIS AND WASSATAQUOIK STREAMS TO PENOBSCOT BOOM.

Year.	Amount driven (thousand feet).	Tax per thousand.	Remarks.
1898	10,536,360	$0.30	
1899	8,402,150	.33½	First drive.
	6,082,140	.33	Second drive.
1900	19,621,090	.36½	
1901	12,845,680	.49	First drive.
	5,485,480	.51	Second drive.
1902	16,947,270	.61	Two drives.
1903	2,035,560	.49	First drive.
	5,150,810	.53¾	Second drive.
	300,000	.53¾	Rafted out spring 1904.
1904	11,478,080	.62½	First drive.
	2,968,000	.62½	Second drive.
1905	4,686,350	.98	
1906	14,180,530	.70	
1907	3,998,235	.88	
Average		.555	

FROM WHETSTONE FALLS TO PENOBSCOT BOOM.

1902	1,148,490	$0.61	Second drive.
1905	6,362,420	.77	First drive.
1907	2,197,520	1.65	
Average		1.01	

FROM SOLDIER BROOK TO PENOBSCOT BOOM.

1902	2,536,950	$0.56	
1904	2,629,180	.56½	
1905	3,104,810	.74	
Average		.622	

FROM MUD BROOK TO PENOBSCOT BOOM.

1900	3,219,390	$0.35½	
1903	2,188,350	.43	
1907	858,470	.78	
Average		.522	

FROM GRINDSTONE TO PENOBSCOT BOOM.

1899	813,270	$0.33½	
1901	3,104,080	.33	
1905	3,263,510	.73	
1907	3,496,190	1.15	
Average		.636	

FROM MEDWAY TO PENOBSCOT BOOM.

1907	4,771,740	$0.80	

Amount and cost of log driving on Penobscot River and tributaries—Continued.

Mattawamkeag River, tax for partial distances.

Year.	From—	To Lincoln.	To Montague.	To Penobscot boom.
1903	Gellerson boom	$0.58	$0.58	$0.58
1904	do	.70¾	.70¾	.70¾
	do	.60¼	.60¼	.60¼
1905	do		.68	.68
	do		.68	.68
1906	do	.77	.77	.77
1907	do	.75	.75	.75
Average		.68	.69	.69
1903	Wytopitlock	.53	.53	.53
1904	do			.65¼
1904	do			.55¾
1905	do			.63
Average		.53	.53	.59
1904	Baskahegan			.59¾
	do			.69¼
Average				.65
1903	Molunkus			.51
1904	do			.63¾
1905	do			.61
Average				.59
1904	Mattakeunk			.63¾
1905	do			.61
Average				.62

Passadumkeag River, tax for partial distances.

Year.	To Penobscot boom from—				
	Nicatous.	Pistol.	Madagascal.	Grand Falls.	Saponic.
1903	$0.80½	$0.32½	$0.32½		
1903		.48½	.48½		
1903		.60½	.60½		
1904	1.00	.77	.52		$0.52
1904	1.00	.77	.62		
1904			.62		
1905	.74¾	.45	.31½		
1906	.56		.32	$0.47	
1906			.28		
1907	.83	.37	.25		
1907	.50				
Average	.78	.54	.42	.47	.52
1908	.46	.33	.31	[a] .46	
1909, first drive	.66¾ .51¼				
1909, second drive	.61⅞ .46⅞				
1910, mouth of Nicatous Stream	.58				
1910, Nicatous Lake	.75				

[a] Foot of Grand Falls.

The following table, giving the cost of driving per mile-thousand and per ton-mile, is compiled from the above data; it is assumed that 1,000 feet board measure weigh 3,500 pounds:

Cost of log driving on Penobscot River and tributaries.

West Branch of Penobscot River from head of Chesuncook Lake to Penobscot boom, 1898-1902.

Location of drive.	Distance in miles.	Average tax per thousand.	Cost of driving.	
			Per mile-thousand.	Per ton-mile.
Head of Chesuncook Lake to boom of Great Northern Paper Co	53	$0.79	$0.0149	$0.0085
Lincoln	94	1.24	.0132	.0075
Montague	106	1.29	.0122	.0070
Penobscot boom	120	1.17	.0098	.0056
Foot of Chesuncook Lake to boom of Great Northern Paper Co	37	.63	.0170	.0097
Lincoln	78	1.04	.0134	.0077
Montague	90	1.09	.0121	.0069
Penobscot boom	104	.98	.0094	.0054
Sourdnahunk Stream to North Twin Dam	25	.53½	.0214	.0122
Lincoln	67	1.06	.0158	.0090
Montague	78	1.06	.0136	.0078
Penobscot boom	92	1.01	.0110	.0063
Ambejejus Lake to boom of Great Northern Paper Co	10	.47	.0470	.0268
Montague	63	.82½	.0131	.0075
Penobscot boom	77	.68	.0088	.0050
Pemadumcook Lake to Lincoln	54	.65¼	.0121	.0069
Montague	65	.65½	.0101	.0058
Penobscot boom	78	.60	.0077	.0044
North Twin dam to Lincoln	42	.56	.0133	.0076
Penobscot boom	66	.52	.0079	.0045
Shad Pond to Lincoln	34	.31½	.0093	.0053
Montague	46	.48½	.0105	.0060
Penobscot boom	59	.40	.0068	.0039

West Branch of Penobscot River from Shad Pond to Penobscot boom, 1903-1907.

Location of drive.	Distance in miles.	Average tax per thousand.	Per mile-thousand.	Per ton-mile.
Shad Pond to Lincoln	34	$0.77	$0.0226	$0.0129
Penobscot boom	59	.77	.0131	.0075

Head of Chesuncook Lake to Shad Pond, 1903-1912.[a]

Location of drive.	Distance in miles.	Average tax per thousand.	Per mile-thousand.	Per ton-mile.
Head of Chesuncook Lake to Shad Pond	60	$0.70	$0.0117	$0.00678
Foot of Chesuncook Lake to Shad Pond	44	.53	.0120	.0069
Sourdnahunk Stream to Shad Pond	32	.50	.0156	.0089
Head of Ambejejus Lake to Shad Pond	19	.30	.0158	.0090
Foot of Pemadumcook Lake to Shad Pond	12	.16¼	.0135	.0077
North Twin dam to Shad Pond	7	.11	.0157	.0090

East Branch of Penobscot River from Grand Lake Dam to Penobscot boom, 1898-1907.

Location of drive.	Distance in miles.	Average tax per thousand.	Per mile-thousand.	Per ton-mile.
Grand Lake dam to Penobscot boom	89	$0.90	$0.0101	$0.0058
Lincoln	63	1.03	.0164	.0094
Haskell Rock to Penobscot boom	84	.82	.0098	.0056
Hulling Machine to Penobscot boom	82	.58	.0071	.0041
Seboeis River to Lincoln	47	.66	.0140	.0080
Penobscot boom	72	.56	.0078	.0045
Whetstone Falls to Penobscot boom	67	1.01	.0151	.0086
Soldier Brook to Penobscot boom	62	.62	.0100	.0057
Mud Brook to Penobscot boom	61	.52	.0085	.0049
Grindstone Falls to Penobscot boom	59	.64	.0108	.0062
Medway to Penobscot boom	51	.80	.0157	.0090

[a] Tax fixed by act of State legislature.

Cost of log driving on Penobscot River and tributaries—Continued.

Mattawamkeag River from Gellerson boom to Penobscot boom, 1903-1907.

Location of drive.	Distance in miles.	Average tax per thousand.	Cost of driving.	
			Per mile-thousand.	Per ton-mile.
Gellerson boom to Lincoln	52	$0.68	$0.0131	$0.0075
Montague	63	.69	.0110	.0063
Penobscot boom	77	.69	.0090	.0051
Baskahegan Stream to Penobscot boom	67	.65	.0097	.0051
Wytopitlock Stream to Lincoln	34	.53	.0156	.0089
Montague	46	.53	.0115	.0066
Penobscot boom	59	.59	.0100	.0057
Molunkus Stream to Penobscot boom	48	.59	.0120	.0069
Mattakeunk Stream to Penobscot boom	43	.62	.0144	.0082

Passadumkeag River from Nicatous Lake to Penobscot boom, 1903-1907.

Saponic Lake to Penobscot boom	20	$0.52	$0.0260	$0.0149
Madagascal Stream to Penobscot boom	24	.42	.0175	.0100
Grand Falls to Penobscot boom	26	.47	.0177	.0101
Pistol Lake to Penobscot boom	30	.54	.0180	.0103
Nicatous Lake to Penobscot boom	34	.78	.0229	.0131

It will be observed from the above table that the value for the average tax per mile varies greatly with the difference in length of distance driven and the difficulties encountered, but apparently the average cost of driving per ton-mile is 0.85 cent; the highest is 2.68 cents and the lowest 0.4 cent.

IMPROVEMENTS IN LOG-DRIVING FACILITIES.

Many things may be done to improve the facilities for driving logs and thereby effect economy in cost of driving and in the amount of water required to float the logs. Dams may be built for the storage of water to be used during the driving season, or for the purpose of creating backwater, thus making smooth an otherwise rough stretch of the river. The whole pond storage may be let out at one time, so as to furnish a "flush" which will float the logs over the shallow and rough places. Rocks and ledges may be blasted out of the channel. Abutments and wings may be built at some of the abrupt turns in the river. Piers and booms may be constructed. A considerable outlay is needed to maintain the booms and existing dams in proper repair. Although much money has been spent on improvements, there is a pressing need for additional expenditure, for with the increased storage for power development should come also improved facilities for log driving, so that the water shall not be wasted when the logs are driven.

It will be noted that wherever a dam has been built for power development the conditions have, in general, been improved for log driving. Notable among these improvements are the dams at East Millinocket and Dolby, on the main river a short distance above the mouth of East Branch, which have flooded a considerable stretch of rough water and thereby greatly improved conditions for log driving. The following table indicates some of the expenses occasioned by improvements during recent years:

Expenses for improvements on West Branch of Penobscot River from Chesuncook Lake to Medway for the years 1893–1902.[a]

Year.	Repairs on main dams.	Repairs on steamers.	Repairs on dams and piers.	Blasting on river.
1893	$1,525.54	$18,322.48	$158.44	....
1894	678.11	....	....	....
1895	1,235.78	350.17	....	....
1896	1,224.30	367.89	....	....
1897	2,263.74	....	....	....
1898	3,779.95	....	141.37	....
1899	10,527.78	728.55	....	$25.00
1900	6,744.62	....	1,049.82	....
1901	5,975.16	....	....	....
1902	4,862.11	9,928.20	1,282.35	....
	38,817.09	24,747.29	2,631.98	25.00
Average annual expense for 10 years	3,881.71	2,474.73	263.20	2.50

[a] These expenses include in some years the building and care of dams.

Expenses for improvements on the main river from Medway to the Penobscot boom by the Penobscot River Dam & Improvement Co., 1898–1907.[1]

1898	$1,721.00	1905	$2,373.00
1899	2,535.00	1906	1,700.00
1900	2,946.00	1907	2,900.00
1901	2,450.00		23,325.00
1902	3,000.00	Average yearly expense	2,332.50
1903	1,900.00		
1904	1,800.00		

Expenses for improvements on East Branch of Penobscot River from Grand Lake dam to Medway, 1898–1906.[2]

1898	$774.00	1903	$786.00
1899	1,939.25	1904	1,758.00
1900	875.00	1905	1,962.12
1901	610.00	1906	500.00
1902	375.00		

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[1] These expenses include blasting out rocks and ledge in the river, repairs to dams, hanging and taking care of the booms, and manning them, and executive expense.

[2] Some of the amounts here shown include the building of several piers, but for the most part they are for blasting out ledges and rocks in the river.

GAZETTEER OF RIVERS, LAKES, AND PONDS IN THE PENOBSCOT RIVER DRAINAGE BASIN.

By Gertrude E. Schulz.

The streams, lakes, and ponds described in the following pages comprise all that are named on the Bluehill, Orono, Orland, Bucksport, Bangor, and Penobscot Bay sheets of the United States topographic atlas and on an 8-sheet manuscript map of Maine (scale 1 inch=3 miles) compiled by C. C. Babb from the best data available.

Abaconetie Bog, Somerset County, T. 6, R. 17; the Northeast Branch of Penobscot River enters the bog from the northwest and passes from its southern end to join the North Branch of Penobscot River (tributary to West Branch of Penobscot River); a small unnamed stream flows into the bog from the east; length (approximate), about one-fourth mile; width, maximum, about one-third mile; area of water surface, 0.08 square mile; drainage area not measured. Sheet 2, Maine State map.

Abol Pond, Piscataquis County, T. 2, R. 9; inlets, two unnamed streams from the north; outlet, a short stream from the west, entering West Branch of Penobscot River; length (approximate), 1½ miles; maximum width, two-thirds mile; area of water surface, 0.19 square mile; drainage area not measured. Sheet 2, Maine State map.

Adams Farm Pond, Penobscot County, northwestern Howland Township; outlet, through an unnamed stream, about 3 miles long, to Piscataquis River (tributary to Penobscot River); length (approximate), 1½ miles; maximum width, three-fourths mile; area of water surface, 0.85 square mile; drainage area not measured. Sheets 6 and 7, Maine State map.

Alamoosook Lake, Hancock County, west-central Orland Township; inlets, Meadow Brook, Gulch Brook, streams from Toddy and Craig ponds, Dead River, and one small unnamed stream; outlet, Orland River (to Penobscot River); elevation, 20 feet; length (approximate), 2 miles; maximum width, 1 mile; area of water surface, 1.51 square miles; Orland sheet, U.S.G.S.

Alder Brook, Piscataquis County; rises in Harriman Pond in western Sebec Township; flows generally southeastward to Piscataquis River (tributary to Penobscot River); has no tributaries; length (approximate), 7 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Alder Brook, Somerset County; rises in Fish Pond in south-central T. 3, R. 3; flows northeastward to its junction with South Branch of Penobscot River (tributary to West Branch of Penobscot River); receives the flow of two small unnamed ponds; length, about 6 miles; drainage area not measured. Sheet 2, Maine State map.

Alder Brook, Washington County; rises in an unnamed pond in central T. 8, R. 3; flows northwestward for about 1 mile, then turns and flows generally southward for about 9 miles, turning again and flowing east and northeastward into Baskahegan Lake (tributary through Baskahegan Stream to Mattawamkeag River, which flows into Penobscot River); receives the flow of about 15 short unnamed streams; length (approximate), 21 miles; drainage area not measured. Sheet 6, Maine State map.

Alder Stream, Piscataquis County; rises in Western Dover Township; flows generally eastward and northeastward to Piscataquis River (tributary to Penobscot River); receives the flow of about 10 short unnamed streams; length (approximate), 16 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Allagash Lake, Piscataquis County, Tps. 7, R. 14, and 8 R. 14; inlets, one short unnamed stream from the southeast and Allagash stream which flows through the lake, forming its outlet into Chamberlain Lake (tributary through Round Pond and Telos Lake to Webster Brook, which flows through Grand Lakes to East Branch of Penobscot River); length (approximate), 4 miles; maximum width, 2¾ miles; approximate area of water surface (wells), 7 square miles; present storage, 8 feet; drainage area at outlet, 102 square miles. See pages 177 of this report. Sheets 2 and 6, Maine State map.

Allagash Stream, Somerset County; rises in an unnamed pond in extreme northeastern part of T. 8, R. 16; flows generally southeastward through Allagash Lake into Chamberlain Lake (tributary through Round Pond and Telos Lake to Webster Brook, which flows through Grand Lakes, to East Branch of Penobscot River); receives the overflow of Crescent, Mud, Narrow, and Mile ponds, and about eight unnamed streams, ranging in length from 2 to 5 miles; length (approximate), 18 miles; drainage area at its entrance into Chamberlain Lake, 124 square miles. Sheets 2 and 6, Maine State map.

Ambejejus Lake, Piscataquis County, T. 1, R. 9; inlets, overflow of Millinocket Lake at highwater stage and West Branch of Penobscot River, which flows through it into Pemadumcook Lake; length, approximate, 4 miles; maximum width, about 1½ miles; approximate area of water surface (wells), including North and South Twin Lakes and Pemadumcook Lake, 24.9 square miles; present storage, 25 feet; drainage area, including all of West Branch of the Penobscot up to head of Ambejejus Lake, 1,600 square miles. See page 167 of this report. Sheets 2 and 6, Maine State map.

Avery Pond, Piscataquis County, T. 7, R. 15; inlets, two small unnamed streams from the north and south, each about 4 miles long and receiving the flow of a number of smaller streams; outlet, a short stream from the southeast to Caucogomuc Lake (tributary to Chesuncook Lake on West Branch of Penobscot River); length (approximate), one-half mile; maximum width, about one-fourth mile; area of water surface, 0.06 square mile; drainage area not measured. Sheet 2, Maine State map.

B. Pond, Piscataquis County, T. B, R. 11; inlets, an unnamed stream from the south, about 3 miles long, and Gurnsey Brook from the west, which flows through the pond, forming its outlet to East Branch of Pleasant River, whose junction with the West Branch in T. 5, R. 8, forms Pleasant River (tributary to Piscataquis River, which flows to Penobscot River); length (approximate), 2 miles; maximum width, three-fourths mile; approximate area of water surface, 0.97 square mile; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

Babcock Brook, Aroostook County, rises in T. 3, R. 4; flows generally southeastward to West Branch of Mattawamkeag River (tributary to Mattawamkeag, which joins Penobscot River in Mattawamkeag Township, Washington County); receives the flow of two short unnamed streams; length (approximate), 8 miles; drainage area not measured. Sheet 6, Maine State map.

Bailey Brook, Piscataquis County, rises in extreme northeastern part of T. 6, R. 11; flows generally eastward through Grand Lake to East Branch of Penobscot River; length (approximate), 7 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Baker Brook, Penobscot County; rises in central Bradley Township, at an elevation of about 200 feet; flows slightly northwestward to Sunkhaze Stream, thence to Penobscot River; receives the flow of two short unnamed streams in the extreme upper part of its course; length (approximate), 6½ miles; total fall, 80 feet; drainage area not measured. Orono sheet, U. S. G. S.

Baker Brook, Penobscot County; rises in southeastern Corinth Township, at an elevation of 180 feet; flows generally southeastward and southward to its junction with Kenduskeag River (tributary to Penobscot River), in Kenduskeag Township, receives the flow of two short unnamed streams from the east; length (approximate), 6½ miles; total fall, 60 feet; drainage area not measured. Bangor sheet, U. S. G. S.

Bald Brook, Somerset County; rises in central Sandy Bay Township; flows generally westward to its junction with South Branch of the Penobscot (tributary to West Branch of Penobscot River) in Hammond Township; receives the overflow of Duncan Pond from the north and Jones Pond from the south, besides about six unnamed small streams; length, about 14 miles; drainage area not measured. Sheet 2, Maine State map.

Bald Mountain Pond, Somerset County, eastern Bald Mountain Township; inlet, an unnamed stream from the west; outlet, through Marble Pond and Marble Brook to Piscataquis River (tributary to Penobscot River); length (approximate), almost 2 miles; maximum width, three-fourths mile; approximate area of water surface, 1.81 square miles; present storage, 4 feet; additional available storage, 7 feet; drainage area not measured. Sheets 3 and 7, Maine State map.

Bank Brook, Penobscot County; rises on the line between Tps. 2 and 3, R. 7; flows in a circuitous course, but in general westerly to the East Branch of Penobscot River; length (approximate), 2½ miles; drainage area not measured. Sheet 6, Maine State map.

Baskahegan Lake, Washington County, Brookton and Topsfield townships, inlets, overflow from Jackson Brook Lake and Pickerel Lake, Alder, Jenkins, and Dead brooks, besides the flow of several small unnamed streams; outlet, Baskahegan Stream to Mattawamkeag River (tributary to Penobscot River); length (approximate), 5 miles; maximum width, nearly 4 miles; approximate area of water surface; 16.40 square miles; present storage, 7 feet; additional available storage, 10 to 12 feet; drainage area not measured. See page 178 of this report. Sheet 6, Maine State map.

Baskahegan Stream, Washington County; rises in Baskahegan Lake, in Brookton Township, flows generally northward to Aroostook County, thence turns and flows northwestward to Mattawamkeag River (tributary to Penobscot River); receives the overflow of Hot Brook Lake, besides that of innumerable small unnamed streams; length (approximate), 18 miles; drainage area at outlet Baskahegan Lake, 151 square miles. Sheet 6, Maine State map.

Battle Brook; see *Big Battle Brook.*

Bean Brook, Piscataquis County; rises in T. 2, R. 11; flows slightly southwestward for about 3 miles, when it turns southeastward to its entrance into Nahmakanta Lake (tributary through Pemadumcook Lake and Twin Lakes to West Branch of Penobscot River); receives the flow of Bear Brook from the west; length (approximate), 6 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Bear Brook, Piscataquis County; rises in an unnamed pond in T. 1, R. 12; flows almost due north to its junction with Ragged Stream, which flows through Caribou Lake to Chesuncook Lake (on West Branch of Penobscot River); has no tributaries; length (approximate), 3 miles; drainage area not measured. Sheet 2, Maine State map.

Bear Brook, Piscataquis County; rises in T. 2, R. 12; flows southward for about 3 miles, thence westward to Bean Brook, which flows to Nahmakanta Lake (tributary to Pemadumcook Lake and Twin Lakes on West Branch of Penobscot River); receives the flow of an unnamed stream about 2 miles long and the overflow of a small pond from the west; length, about 4½ miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Bear Pond, Piscataquis County, T. 7, R. 8 N. W. P.; inlet, short stream from east; outlet by short stream into Sebec Lake, thence through Sebec River to Piscataquis

River (tributary to Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Beaver Bog, Somerset County, T. 5, R. 20 W. E. L. S.; inlet, Roberts Brook from the west; outlet, by Roberts Brook to North Branch of Penobscot River (tributary to West Branch of Penobscot River); area of water surface, 0.03 square mile; drainage area not measured.

Beaver Brook, Aroostook County; rises in a small unnamed pond in southwestern Linneus Township; flows in a rather circuitous course southward and southeastward to join the East Branch of Mattawamkeag River (tributary to Mattawamkeag River, which discharges into Penobscot River); receives the overflow of Tenmile Lake; length (approximate), 12 miles; drainage area not measured. Sheet 6, Maine State map.

Beaver Brook Lake, Aroostook County, Linneus; inlets, small stream from north, one from east, and one from west; outlet, by Beaver Brook to Mattawamkeag River (tributary to Penobscot River); area of water surface, 0.08 square mile; drainage area not measured.

Beaver Pond, Penobscot County, T. 7, Rs. 6 and 7 W. E. L. S.; outlet by short stream to Grand Lake, thence through Snowshoe Lake and Whitehorse Lake to Seboeis Stream (tributary to East Branch of Penobscot River); area of water surface, 0.22 square mile; drainage area not measured.

Beaver Pond, Penobscot County, Springfield; outlet by short stream through Mattagoudas Stream to Mattawamkeag River (tributary to Penobscot River); area of water surface, 0.06 square mile; drainage area not measured.

Beaver Pond, Piscataquis County, T. 3, R. 11 W. E. L. S.; inlet, one short unnamed stream from the northeast; outlet, through small stream into Sourdnahunk Stream (tributary to West Branch of Penobscot River); area of water surface, 0.02 square mile; drainage area not measured.

Beaver Pond, Piscataquis County, T. 3, R. 13 W. E. L. S.; outlet through small stream to Pine Stream (tributary to West Branch of Penobscot River); area of water surface, 0.06 square mile; drainage area not measured.

Ben Annis Pond, Penobscot County; about three-sixteenths mile south of Hermon Pond in southwestern Hermon Township; inlet, overflow of Patten Pond; outlet, to Hermon Pond (tributary through Souadabscook Stream to Penobscot River); elevation, 122 feet; area of water surface, 0.08 square mile; drainage area not measured. Bangor and Bucksport sheets, U. S. G. S.

Bennett Pond, Piscataquis County, Parkman; outlet by short stream into Piscataquis River (tributary to Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Benson Pond, Piscataquis County, Willimantic; outlet by short stream into Onawa Stream, thence through Sebec Lake and Sebec Stream into Piscataquis River (tributary to Penobscot River); area of water surface, 0.24 square mile; drainage area not measured.

Benson Ponds (3 connected), Piscataquis County, T. 7, R. 9; outlet, through Houston Pond and Houston Brook to West Branch of Pleasant River (tributary to Pleasant River, which flows to a branch of Penobscot River); the largest of the ponds is about one-eighth mile long and less than one-eighth mile wide; area of water surface, 0.65 square mile; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

Big Battle Brook, Aroostook County; rises in northern Glenwood Township; flows southeastward to Mattawamkeag River (tributary to Penobscot River); receives the flow of 2 short unnamed streams; length (approximate), 9 miles; drainage area not measured. Sheet 6, Maine State map.

Big Lane Brook, Somerset County; rises in T. 4, R. 18; flows southward to its junction with North Branch of Penobscot River (tributary to West Branch of Penobscot

River); receives the flow of about 5 small unnamed streams; length, about 4½ miles; drainage area not measured. See also *Lane Brook*. Sheet 2, Maine State map.

Big Lyford Pond, Piscataquis County, T. A, R. 12; outlet, through West Branch of Pleasant River to Pleasant River (tributary to Piscataquis River, which in turn flows into Penobscot River); length (approximate), three-fourths mile; maximum width, one-half mile; area of water surface, 0.17 square mile; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

Big Lyford Pond, Piscataquis County, Tps. 7 and 8, R. 10 N. W. P.; outlet by small stream to West Branch of Pleasant River, thence through Pleasant River to Piscataquis River (tributary to Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Big Marsh Brook, Penobscot County; rises in T. 2, R. 8; flows in a general southwesterly direction to Mattamiscontis Stream (tributary to Penobscot River); receives the flow of a short unnamed stream from the east; length (approximate), 7 miles; drainage area not measured. Sheets 6 and 7, Maine State map.

Big Mud Brook, Penobscot County; rises in T. 3, R. 8; flows southward to Millinocket Lake, which discharges through Shad Pond to West Branch of Penobscot River; receives the flow of two small streams from the west; length (approximate), 6 miles; drainage area not measured. Sheet 6, Maine State map.

Big Pond, Piscataquis County, T. 4, R. 9; outlet, through Turner Brook to Wassataquoik Stream (tributary to East Branch of Penobscot River); length (approximate), seven-eighths mile; maximum width, about one-half mile; approximate area of water surface, 0.19 square mile; drainage area not measured. Sheet 6, Maine State map.

Big Smith Brook Pond, Penobscot County, Millinocket; inlet, small stream from the northeast; outlet, by Smith Brook into Millinocket Stream (tributary to West Branch of Penobscot River); area of water surface, 0.24 square mile; drainage area not measured.

Billfish Pond, on the Piscataquis-Penobscot County line, between T. 6, R. 8, and T. 6, R. 9; inlet, a small unnamed stream from the northeast; outlet, to East Branch of Penobscot River; length (approximate), one-half mile; maximum width, about one-third mile; area of water surface, 0.09 square mile; drainage area not measured. Sheet 6, Maine State map.

Birch Stream, Hancock County; rises in northwestern part of T. 32 M. D.; flows northwestward to Sunkhaze Stream (tributary to Penobscot River); length (approximate), 7½ miles; drainage area not measured. Sheet 7, Maine State map, and Orono sheet U.S.G.S.

Birch Stream, Penobscot County; rises in west-central Lagrange Township; flows generally southeastward to Penobscot River in northeastern Oldtown Township; receives the flow of a short unnamed stream in the extreme upper part of its course, besides the overflow of two unnamed ponds from the west; length (approximate), 15 miles; drainage area not measured. Sheet 7, Maine State map.

Black Pond, Piscataquis County, T. 1, R. 12; inlet, a small stream from the south; outlet, Black Stream to Ragged Stream (tributary to Caribou Lake, which discharges to Chesuncook Lake on West Branch of Penobscot River); length (approximate), one-half mile; maximum width, one-third mile; area of water surface, 0.46 square mile; drainage area not measured. Sheet 2, Maine State map.

Black Pond, Piscataquis County, on line between T. 6, R. 14, and T. 6, R. 13; inlet, one short unnamed stream and Caucomgomuc Stream, which flows through the pond to Chesuncook Lake on West Branch of Penobscot River; length (approximate), 1¼ miles; maximum width, about three-fourths mile; area of water surface, 0.60 square mile; drainage area not measured. Sheet 2, Maine State map.

Black Stream, Penobscot County; rises in northwestern Levant Township; flows slightly southeastward for about 5 miles to boundary between Carmel and Hermon townships, thence northeastward to its junction with Kenduskeag River (tributary to Penobscot River); receives the flow of perhaps six short unnamed streams; length (approximate), 15 miles; drainage area, 40 square miles. See page 96 of this report. Sheets 3 and 7, Maine State map.

Black Stream, Penobscot County; rises in northern Garland Township; flows generally northwestward to Piscataquis River (tributary to Penobscot River); receives the flow of two short unnamed streams, besides the overflow of Man Pond; length (approximate), 12 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Black Stream, Piscataquis County, T. 2, R. 12; rises in Black Pond, T. 1, R. 12; flows northwestward to its junction with Ragged Stream (tributary to Caribou Lake, which discharges to Chesuncook Lake on West Branch of Penobscot River); receives the flow of two unnamed streams and the overflow from Mud and Black ponds; length (approximate), about 4 miles; drainage area not measured. Sheet 2, Maine State map.

Blackberry Pond, Piscataquis County, T. 2, R. 13; outlet, through a small unnamed lake to Ragged Stream (tributary to Caribou Lake, which discharges to Chesuncook Lake on West Branch of Penobscot River); length (approximate), one-half mile; maximum width, one-sixteenth mile; area of water surface, 0.22 square mile; drainage area not measured. Sheet 2, Maine State map.

Blackman Brook, Penobscot County; rises in central Eddington Township, at an elevation of about 200 feet; flows generally northwestward to Penobscot River in extreme northern Eddington Township; length (approximate), 5 miles; total fall, 120 feet; drainage area not measured. Orono sheet, U.S.G.S.

Blackman Brook, Penobscot County; rises in central T. 3, R. 1; flows generally northwestward through an unnamed pond to Coffee Brook (tributary to Madagascal Pond, which discharges to Madagascal Stream into the Passadumkeag, a tributary of the Penobscot River); has no tributaries; length (approximate), 4 miles; drainage area not measured. Sheet 7, Maine State map.

Blackman Stream, Penobscot County; rises in Chemo Pond in southern Bradley Township, at an elevation of 126 feet above sea level; flows northwestward to Penobscot River in western Bradley Township; length (approximate), 6 miles; total fall, 80 feet, mostly in the lower part of its course; drainage area not measured. Orono sheet, U.S.G.S.

Blunder Pond, Piscataquis County, T. 6, R. 10 W. E. L. S.; outlet by Wadleigh Brook to Trout Stream, thence to Grand Lake, East Branch of Penobscot River; area of water surface, 0.09 square mile; drainage area not measured.

Bog Brook, Washington County; rises in T. 8, R. 4; flows northward and northwestward to Mattawamkeag River (tributary to Penobscot River); receives the flow of one short unnamed stream from the south; length (approximate), 4½ miles; drainage area not measured. Sheet 6, Maine State map.

Bog Brook, Penobscot County; rises in northwestern Kingsbury Township; flows eastward to Thorn Brook, thence to South Branch of Piscataquis River, which joins the Piscataquis (tributary to Penobscot River) in southern Abbot Township; length (approximate), 3 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Bog Stream, Piscataquis County; rises in southern Little Squaw Township; flows generally southward to Marble Brook (tributary Piscataquis River, which flows to the Penobscot); receives the flow of four short unnamed streams, besides the overflow of an unnamed pond on the west about 1½ miles long and one-half mile wide; length (approximate), 9 miles; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Bog Stream, Somerset County; rises in northwestern part of Soldiertown; flows northeastward to its junction with South Branch of Penobscot River (tributary to West Branch of the Penobscot) in Pittston Township; receives from the west one unnamed stream about three-fourths mile long; length, about 3 miles; drainage area not measured. Sheet 2, Maine State map.

Boody Brook, Penobscot County; rises in T. 8, R. 8; flows northeastward through Seboeis Lake and Grand Lakes to East Branch of Penobscot River; length (approximate), 3 miles; drainage area not measured. Sheet 6, Maine State map.

Boody Brook, Piscataquis County; rises in T. 6, R. 10; flows generally northeastward through Second Grand Lake to East Branch of Penobscot River; length (approximate), about 4 miles; drainage area not measured. Sheet 6, Maine State map.

Bottle Pond, Piscataquis County, T. 2, R. 9; outlet, a short stream about one-half mile long flowing to Millinocket Lake (tributary to West Branch of Penobscot River); length (approximate), two-thirds mile; maximum width, one-half mile; area of water surface, 0.04 square mile; drainage area not measured. Sheet 6, Maine State map.

Bowlin Pond, Penobscot County, T. 5, R. 8; inlets, 4 small unnamed streams, ranging in length from 1½ to 4½ miles; outlet, through East Branch of Penobscot River to Penobscot River; length (approximate), 1 mile; maximum width, about one-half mile; approximate area of water surface, 0.52 square mile; present storage, 4 feet; drainage area not measured. Sheet 6, Maine State map.

Boyd Lake, Piscataquis County, central Ornville Township; outlet, through Dead Stream to Pushaw Stream (tributary to Stillwater River—the west channel of Penobscot River at Orson and Marsh islands); length (approximate), 2 miles; maximum width, about three-fourths mile; approximate area of water surface, 0.14 square mile; drainage area not measured. Sheet 7, Maine State map.

Boynton Brook, Penobscot County; rises in west-central Bradley Township, at an elevation of about 110 feet above sea level; flows slightly northwestward to Great Works Stream (tributary Penobscot River); length (approximate), 2¾ miles; total fall, about 35 feet; drainage area not measured. Orono sheet, U.S.G.S.

Brandy Stream, Piscataquis County; rises in T. 5, R. 14; flows westward to its junction with Caucomgomuc Stream, which empties into Chesuncook Lake on West Branch of Penobscot River; no tributaries; length (approximate), 3 miles; drainage area not measured. Sheet 2, Maine State map.

Brayley Brook, Aroostook County; rises in Brayley Lake in T. 3, R. 4; flows slightly southeastward to Wytopitlock Stream (tributary to Mattawamkeag River, which flows into Penobscot River); receives the flow of two short unnamed streams; length, about 7 miles; drainage area not measured. Sheet 6, Maine State map.

Brayley Lake, Aroostook County, T. 3, R. 4; inlets, 3 short unnamed streams; outlet, Brayley Brook to Wytopitlock Stream (tributary to Mattawamkeag River, which flows into Penobscot River); length (approximate), 1 mile; maximum width, less than one-half mile; approximate area of water surface, 0.38 square mile; drainage area not measured. Sheet 6, Maine State map.

Brewer Pond, Penobscot County, Orrington and Holden townships, and Hancock County, Bucksport Township; elevation, 107 feet; inlets, three short unnamed streams and the overflow of Mud Pond to the south; outlet, through Fields Pond to Sedgeunkedunk Stream (tributary to Penobscot River); length (approximate), 2½ miles; maximum width, two-thirds mile; area of water surface, 1.38 square miles; drainage area not measured. Orland, Bucksport, and Bangor sheets, U.S.G.S.

Brown Brook, Penobscot County; rises in T. 3, R. 1; flows generally southeastward to join the Passadumkeag (tributary to Penobscot River); receives the flow of one short unnamed stream about 1 mile from its source; length (approximate), 3 miles; drainage area not measured. Sheet 7, Maine State map.

Brown Pond, Piscataquis County, T. 8, R. 10 N. W. P.; inlets, two small streams from north; outlet through Hedgehog Pond, Trout Pond, and Long Pond into Onawa Stream, thence through Sebec Lake and Sebec River to Piscataquis River (tributary to Penobscot River); area of water surface, 0.06 square mile; drainage area not measured.

Browns Pond, Hancock County, west-central Bucksport Township; elevation, 226 feet; inlets, two short unnamed streams from the northwest, and the overflow of Trout Pond; outlet, through Mud, Brewer, and Fields ponds to Sedgeunkedunk River (tributary to Penobscot River); length (approximate), 1 mile; maximum width, one-fourth mile; between point of outlet and entrance to Mud Pond, a distance of about 1 mile, there is a fall of about 50 feet; area of water surface, 0.20 square mile; drainage area not measured. Orland, Bucksport, and Bangor sheets, U.S.G.S.

Burden Pond, Piscataquis County, T. 7, R. 8 N. W. P.; inlets, three streams from north; outlet, by Crooked Pond, Long Pond, and Sebec Lake to Sebec River (tributary to Piscataquis River which flows into Penobscot River); area of water surface, 0.32 square mile; drainage area not measured.

Burnham Pond, Piscataquis County, Sebec; inlet, short stream from west; outlet, by short stream into Piscataquis River (tributary to Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Burnt Pond, Penobscot County, T. 2, R. 6; inlets, a number of small unnamed streams; outlet, through Salmon Stream Ponds to Salmon Stream (tributary to Penobscot River); length (approximate), 1 mile; maximum width, one-half mile; area of water surface, 0.36 square mile; drainage area not measured. Sheet 6, Maine State map.

Burnt Land Pond, Penobscot County, T. 2, R. 7; inlet, Soldier Brook, which flows through the pond to East Branch of Penobscot River; length (approximate), 1 mile; maximum width, less than one-half mile; area of water surface, 0.14 square mile; drainage area not measured. Sheet 6, Maine State map.

Cambolasse Pond, Penobscot County, Lincoln; inlet, stream from Long Pond from east; outlet, by Cambolasse Stream into Penobscot River; area of water surface, 0.39 square mile; drainage area not measured.

Caribou Lake, Aroostook County, on boundary between T. 3, R. 4, and Island Falls townships; inlet, the overflow of Otter Pond; outlet, through Sly Brook to West Branch Mattawamkeag (tributary to Mattawamkeag River, which flows into Penobscot River); length (approximate), 1 mile; maximum width, one-half mile; approximate area of water surface, 1.76 square miles; drainage area not measured. Sheet 6, Maine State map.

Caribou Lake, Piscataquis County, T. 3, Rs. 12 and 13, and T. 2, R. 12; inlets, Ragged Stream and overflow of Deer, Bear, Fisher, and Green ponds; outlet to Chesuncook Lake, on West Branch Penobscot River; length (approximate), 6½ miles; maximum width, about 1 mile; area of water surface, 5.86 square miles; drainage area not measured. Sheet 2, Maine State map.

Caribou Pond, Penobscot County, northeastern Lincoln Township; inlet, the overflow of a small unnamed pond about one-half mile to the northwest; outlet, through Long Pond and a number of small unnamed ponds to Penobscot River; length (approximate), 1¼ miles; maximum width, one-half mile; approximate area of water surface, 0.85 square mile; controlled by a dam; area of water surface, 0.39 square mile; drainage area not measured. Sheet 6, Maine State map.

Carlton Brook, Penobscot County; rises in T. 1, R. 5; flows generally southward through Mattaseunk Lake to Mattaseunk Stream (tributary to Penobscot River); receives the flow of about 6 short unnamed streams; length (approximate), 4 miles; drainage area not measured. Sheet 6, Maine State map.

Carleton Brook, Piscataquis County; rises in southern Kingsbury Township; flows southeastward, then northeastward to South Branch of Piscataquis River, which joins the Piscataquis (tributary to Penobscot River) in southern Abbot Township; receives the flow of a short unnamed stream from the west; length (approximate), 7 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Caucomgomuc Lake, Piscataquis County, T. 7, Rs. 14 and 15, T. 6, Rs. 14 and 15; inlets, Ciss and Loon streams and overflow from Avery and Rose ponds; outlet, Caucomgomuc Stream to Chesuncook Lake, on West Branch of Penobscot River; length (approximate), 6 miles; maximum width, 1½ miles; approximate area of water surface, 7 square miles; present storage, 8 feet; additional storage available, 8 feet; drainage area, 114 square miles. See pages 171-172 of this report. Sheet 2, Maine State map.

Caucomgomuc Stream, Piscataquis County, rises in Caucomgomuc Lake, in T. 6, R. 14; flows southeastward through Black Pond into Chesuncook Lake, on West Branch Penobscot River; tributaries, Little Scot Branch and Brandy Stream from the west and an unnamed stream about 1½ miles long from the east; length, about 10 miles. Sheet 2, Maine State map.

Cedar Pond, Penobscot County, on boundary line between Tps. Long. A and 3, R. 9; outlet, East Branch Seboeis Stream to Seboeis Stream (tributary to Piscataquis River, which flows into Penobscot River); length (approximate), 1½ miles; maximum width, three-fourths mile; approximate area of water surface, 1.10 square miles; drainage area not measured. Sheets 6 and 7, Maine State map.

Chain Pond, Somerset County, Ts. 3 and 4, R. 4 N. B. K. P.; inlet, short stream from the west; outlet, by Penobscot Brook into South Branch of Penobscot River (tributary to West Branch of Penobscot River); area of water surface, 0.35 square mile; drainage area not measured.

Chamberlain Lake, Penobscot County, T. 6, Rs. 11 and 12, T. 7, Rs. 11, 12, and 13, and T. 8, R. 13; inlets, overflow from Mud, Lost, Little, and Leadbetter ponds, Ellis Stream from the west, and Allagash Stream from the northwest; outlet, through Round Pond and Telos Lake to Webster Brook, which discharges through Grand Lake to East Branch of Penobscot River; approximate length, 13 miles; maximum width, 2 miles; approximate area of water surface, 17.48 square miles; present storage, 10 feet; additional available storage, 15 to 20 feet; drainage area not measured. See page 176 of this report. Maine State map, sheets 2 and 6.

Chemo Pond, Penobscot County, Bradley, Eddington, and Clifton townships; elevation, 126 feet; inlets, Parks Pond (western outlet) and Davis Pond; outlet, through Blackman Stream to Penobscot River; length (approximate), 2½ miles; maximum width, 1 mile; approximate area of water surface, 1.80 square miles; drainage area not measured. Orono sheet, U.S.G.S.

Chesuncook Lake, Piscataquis County, T. 5, Rs. 12 and 13, T. 4, Rs. 12 and 13, and T. 3, R. 12; inlets, Caucomgomuc and Umbazooksus streams, Quaker and Red brooks, overflow of Moose and Mud ponds and Caribou Lake, and West Branch of Penobscot River, which flows through it; length (approximate), 18 miles; maximum width, 2 miles; approximate area of water surface, 35.9 square miles; present storage, 22 feet; additional available storage, 4 feet; drainage area, exclusive of Caucomgomuc Lake, 174 square miles. See page 170 of this report. Sheets 2 and 6, Maine State map.

Chesuncook Pond, Piscataquis County, on boundary, between T. 3, R. 11, and T. 2, R. 11; outlet, a small unnamed stream about 2½ miles long emptying into Chesuncook Lake, on West Branch of Penobscot River; length (approximate), two-thirds mile; maximum width, about one-half mile; area of water surface, 0.22 mile; drainage area not measured. Sheet 2, Maine State map.

Ciss Stream, Piscataquis County; rises in Round Pond, in southern T. 7, R. 14, flows southward to Caucogomuc Lake (discharging to Chesuncook Lake on West Branch of Penobscot River); no tributaries; length (approximate), 1½ miles; drainage area not measured. Sheet 2, Maine State map.

Coffeelos Lake, Piscataquis County, T. 6, R. 11; outlet, through Webster Lake and Grand Lakes to East Branch of Penobscot River; length (approximate), two-thirds mile; maximum width, about one-third mile; area of water surface, 0.22 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Coffee Brook, Penobscot County; rises in central T. 3, R. 1; flows generally northwestward to Madagascal Pond, which has outlet by Madagascal Stream to

Passadumkeag River (tributary to Penobscot River); receives two short unnamed streams; length (approximate), 4 miles; drainage area not measured. Sheet 7, Maine State map.

Cold Brook, Aroostook County, rises in an unnamed pond in T. 3, R. 4; flows northward and northwestward through Fish Stream to Mattawamkeag River (tributary to Penobscot River); receives the flow of an unnamed stream from the west and overflow of a small pond near its source; length (approximate), 8 miles; drainage area not measured. Sheet 6, Maine State map.

Cold Stream, Penobscot County, rises in the lower of the Cold Stream Ponds in Enfield Township; flows generally southward to Passadumkeag River (tributary to Penobscot River); receives the flow of a short unnamed stream from the east; length (approximate), 6 miles; drainage area not measured. Gaging station at Enfield. See pages 91-95 of this report. Sheet 7, Maine State map.

Cold Stream Ponds (3 connected), Penobscot County, Enfield and Lincoln townships; outlet through Cold Stream to Passadumkeag River (tributary to Penobscot River); length (approximate) of upper pond, 3 miles; maximum width, one-third mile; length (approximate) of middle pond, 2½ miles; maximum width, 1½ miles; length (approximate) of lower pond, 3 miles; maximum width, 1½ miles; area of water surface, of Upper or Second Pond 1.14 square miles; combined water-surface area of middle and lower ponds 7.38 square miles; controlled by a dam; drainage area not measured. Sheet 7, Maine State map.

Compass Pond, Piscataquis County, T. 2, R. 9; inlet, overflow from Katahdin Pond on the northeast; outlet from the west to River Pond, which discharges to West Branch of Penobscot River; length (approximate) one-half mile; maximum width, less than one-fourth mile; area of water surface 0.14 square mile; drainage area not measured. Sheet 2, Maine State map.

Cooper Brook, Piscataquis County; rises in Crawford Pond in T. A, R. 11; flows in a generally northeasterly direction to its junction with Pratt Brook (tributary to Middle Joe Mary Lake, which has outlet through Lower Joe Mary Lake to Pemadumcook Lake, on West Branch of Penobscot River); receives the flow of about four unnamed streams and the overflow of two ponds; length (approximately), 7½ miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Cooper Pond, Piscataquis County, T. A, R. 10; inlet, Cooper Brook, which flows through the pond from east to west, forming its outlet to Pratt Brook (tributary to Middle Joe Mary Lake, which discharges to Pemadumcook Lake, on West Branch of Penobscot River); length (approximate), one-half mile; maximum width, one-half mile; area of water surface, 0.49 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Copeland Brook, Penobscot County, rises in southern Holden Township, at an elevation of about 450 feet above sea level; flows southwestward into Long Pond, which has outlet by Moosehorn Creek to Dead River (tributary to Orland River, which flows to the Penobscot); receives one tributary, an unnamed stream about 1 mile long, which has its source in McGann Bog; length, about 5 miles; total fall (approximate), 380 feet; drainage area not measured. Orland sheet, U.S.G.S.

Craig Pond, Hancock County, central Orland Township; outlet, through Alamoosook Lake to Orland River (tributary to Penobscot River); elevation, 213 feet; between point of outlet and entrance to Alamoosook Lake, a distance of about 1 mile, there is a fall of approximately 190 feet; length, about 1½ miles; maximum width, about three-fourths mile; area of water surface, 0.33 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Cranberry Pond, Penobscot County, Lowell; outlet by short stream into Cold Stream Pond, thence by Cold Stream to Passadumkeag River (tributary to Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Cranberry Pond, Piscataquis County, T. 3, R. 14; outlet, a short stream about one-half mile long, flowing from its southern end into an unnamed tributary of Lobster Lake (outlet to West Branch of the Penobscot); length (approximate), three-fourths mile; maximum width, about one-half mile; area of water surface, 0.12 square mile; drainage area not measured. Sheet 2, Maine State map.

Crawford Pond, Piscataquis County, T. AR. 11; inlets, from Yoke and Rocky ponds and one other unnamed stream; outlet, by Cooper Brook to Pratt Brook, which flows to Middle Joe Mary Lake (outlet through Lower Joe Mary to Pemadumcook Lake on West Branch of Penobscot River); length (approximate), 1½ miles; maximum width, one-half mile; area of water surface, 0.82 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Crescent Pond, Piscataquis County, T. 9, R. 15; outlet, through Mud Pond to Allagash Stream, which flows through Allagash Lake to Chamberlain Lake (tributary through Round Pond, and Telos Lake to Webster Brook, tributary through Grand Lake to East Branch of Penobscot River); length (approximate), 1 mile; maximum width, one-third mile; area of water surface, 0.34 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Crooked Pond, Penobscot County, Lincoln Township; outlet, through an unnamed pond which overflows into Mattanacook Pond (outlet to Penobscot River); length (approximate), three-fourths mile; maximum width, one-half mile; approximate area of water surface, 0.26 square mile; drainage area not measured. Sheets 6 and 7, Maine State map.

Crooked Pond, Piscataquis County, T. 7, R. 8 N. W. P.; inlets, three streams from north through Burden Pond; outlet through Long Pond and Sebec Lake to Sebec River (tributary to Piscataquis River which flows into Penobscot River); area of water surface, 0.21 square mile; drainage area not measured.

Crystal Stream, Penobscot County; rises in northeastern Mount Chase Township; flows generally southeastward to Fish Stream (tributary to Mattawamkeag River, which joins Penobscot River in Mattawamkeag County); receives from the west an unnamed stream about 6 miles long; length (approximate), 10 miles; drainage area not measured. Sheet 6, Maine State map.

Cunningham Pond, Somerset County, T. 2, R. 4 N. B. K. P.; inlets, short streams from west and north; outlet, by Cunningham Brook into South Branch of Penobscot River (tributary to West Branch of Penobscot River); area of water surface, 0.03 square mile; drainage area not measured.

Cuxabexis Lake, Piscataquis County, T. 5, R. 12; inlets, two unnamed streams (from the north and southeast); outlet, through a small unnamed pond to Moose Pond, which overflows into Chesuncook Lake on West Branch of Penobscot River; length (approximate), 2 miles; maximum width, about 1 mile; approximate area of water surface, 1.54 square mile; present storage, 2 feet; additional storage, 5 to 6 feet; drainage area not measured. Sheet 2, Maine State map.

Daggett Pond, Piscataquis County, T. 7, R. 14; inlet, from Shallow Lake; outlet, a small unnamed stream to Round Pond (outlet by way of Caucomgomuc Lake to Chesuncook Lake on West Branch of Penobscot River); length (approximate), 1 mile; maximum width, about one-half mile; approximate area of water surface, .76 square mile; drainage area not measured. Sheet 2, Maine State map.

Daisy Pond, Piscataquis County, T. 3, R. 10 W. E. L. S.; outlet, by short unnamed stream into Sourdnahunk Stream (tributary to West Branch of Penobscot River); area of water surface, 0.01 square mile; drainage area not measured.

Davidson Pond, Penobscot County, T. 2, R. 6; outlet, through Salmon Stream Ponds to Salmon Stream (tributary to Penobscot River); length (approximate), one-half mile; maximum width, one-eighth mile; area of water surface, 0.15 square mile; drainage area not measured. Sheet 6, Maine State map.

Davis Pond, Penobscot County, T. 5, R. 7 W. E. L. S.; outlet, by short stream about 4 miles long to Seboeis Stream (tributary to East Branch of Penobscot River); area of water surface, 0.08 square mile; drainage area not measured.

Davis Pond, Piscataquis County, southern Willimantic Township; outlet, Davis Stream to Wilson Stream (tributary through Sebec Lake to Sebec River, which joins Piscataquis River, tributary to Penobscot River); length (approximate), three-fourths mile; maximum width, one-third mile; area of water surface, 0.34 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Davis Pond, Penobscot County, Holden and Eddington townships; elevation, 200 feet; inlets, Holbrook Pond and several unnamed streams; outlet, through Chemo Pond and Blackman Stream (tributary to Penobscot River); between the point of outlet and its entrance to Chemo Pond, a distance of about 2½ miles, there is a fall of about 75 feet; approximate area of water surface, 0.68 square mile; controlled by a dam; drainage area not measured. Orono sheet, U.S.G.S.

Davis Stream, Piscataquis County; rises in Davis Pond in southwestern Willimantic Township; flows generally northeastward to Wilson Stream (tributary by way of Sebec Lake to Sebec River, which flows to the Piscataquis, a branch of the Penobscot); receives the overflow of Poverty, Hebron, and Monson ponds, besides two short unnamed streams from the west; length (approximate), 8 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Dead Brook, Washington County; rises near the boundary between Brookton and T. 8, R. 3; flows southeastward to Baskahegan Lake (tributary through Baskahegan Stream to Mattawamkeag River, which flows to Penobscot River); length (approximate), 2 miles; drainage area not measured. Sheet 6, Maine State map.

Dead River, Hancock County; rises in Hothole Pond, northern Orland Township, at an elevation of 35 feet above sea level; flows northwestward through a bog for about three-fourths mile to its junction with Moosehorn Creek, then almost directly southward into Alamoosook Lake, where it joins Orland River (tributary to Penobscot River); principal tributaries, Moosehorn Creek and three unnamed streams; length, about 3½ miles; total fall, approximately 15 feet; drainage area not measured. Orland sheet, U.S.G.S.

Dead Stream, Penobscot County; rises near boundary between Lincoln and Lee townships; flows generally westward to Mattanacook Pond, which discharges through the stream of the same name to Penobscot River; receives the flow of a short unnamed stream about 2 miles from its source; length (approximately), 6 miles; drainage area not measured. Sheet 6, Maine State map.

Dead Stream, Piscataquis County; rises in Boyd Lake in central Ornville Township; flows generally southeastward to Pushaw Stream (tributary to Stillwater River, which flows into the Penobscot) in Alton Township, Penobscot County; besides the flow of three short unnamed streams from the west, it receives the flow of a stream about 14 miles long, also known as Dead Stream; length (approximate), 17 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Dead Stream, Piscataquis County; rises in extreme southern Atkinson Township; flows slightly northeastward for about 3 miles, then turns and flows generally southeastward, joining a stream of the same name in west Alton Township, Penobscot County; receives the flow of a number of short unnamed streams and the overflow of an unnamed pond in the upper part of its course; length (approximate), 14 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Debsconeag Lakes (5, connected), Piscataquis County, T. 2, Rs. 10 and 11, T. 1, Rs. 10 and 11; inlets, a number of small unnamed streams; outlet to West Branch Penobscot River; approximate length of largest lake, 3 miles; maximum width, about one-half mile; area of water surface, First Lake, 0.51 square mile, Second Lake, 0.34 square mile, Third Lake, 1.54 square miles, Fourth Lake 0.52 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Deer Pond, Piscataquis County, T. 2, R. 13; inlet, a small stream from the west about 1 mile long; outlet, an unnamed stream about 3 miles long to Caribou Lake (tributary to Chesuncook Lake on West Branch of Penobscot River); length (approximate), one-half mile; maximum width, one-fourth mile; area of water surface, 0.25 square mile; drainage area not measured. Sheet 2, Maine State map.

Deer Pond, Piscataquis County, T. 3, R. 13; inlet, a small unnamed stream from the south; outlet, a small stream about 1 mile long to Caribou Lake (outlet to Chesuncook Lake, on West Branch of Penobscot River); length (approximate), 1¼ miles; maximum width, about one-third mile; area of water surface, 0.45 square mile; drainage area not measured. Sheet 2, Maine State map.

Dole Brook, Somerset County; rises in Dole Pond, in Dole Township; flows eastward to its junction with North Branch of Penobscot River (tributary to West Branch of Penobscot River); receives the flow of Hurricane Brook, Roberts Brook, and overflow of Long Pond, besides several other small unnamed streams; length, about 6 miles; drainage area not measured. Sheet 2, Maine State map.

Dole Pond, Somerset County, northwestern Dole Township; inlets, two small streams from the west, Roberts Brook from the north, and from the south a small stream from Long Pond; outlet, by Dole Brook to North Branch of Penobscot River (tributary to West Branch of Penobscot River); length (approximate), 1⅓ miles; maximum width, about one-half mile; area of water surface, 0.56 square mile; drainage area not measured. Sheet 2, Maine State map.

Dow Pond, Piscataquis County, central Sebec Township; outlet, through an unnamed stream about 4 miles long to Piscataquis River (tributary to Penobscot River); length (approximate), three-fourths mile; maximum width, one-third mile; area of water surface, 0.06 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Draper Pond, Piscataquis County, T. 3, R. 10 W. E. L. S.; outlet, by small stream into Sourdnahunk Stream (tributary to West Branch Penobscot River); area of water surface, 0.01 square mile; drainage area not measured.

Duck Lake, Penobscot County, T. 4, N. D.; inlets, two short unnamed streams from the north; outlet, through Duck Stream and Nicatous Lake to Nicatous Stream (tributary to Passadumkeag River, which flows into Penobscot River); length (approximate), 2¼ miles; maximum width, 1⅓ miles; approximate area of water surface, 2.13 square miles; present storage, 9 feet; drainage area not measured. Sheet 7, Maine State map.

Duck Pond (Smyrna), Aroostook County, north-central Smyrna Township; inlet, a short unnamed stream from the north; outlet, through East Branch of Mattawamkeag River to Mattawamkeag River (tributary to Penobscot River); length (approximate), one-third mile; maximum width, one-fourth mile; area of water 0.10 square mile; drainage area not measured. Sheet 6, Maine State map.

Duck Pond, Piscataquis County, T. 5, R. 12; outlet, a small stream about 1 mile long flowing northward into Moose Pond (outlet to Chesuncook Lake on West Branch of Penobscot River); length (approximate), 2 miles; maximum width, one-half mile; area of water surface, 0.99 square mile; drainage area not measured. Sheet 2, Maine State map.

Duck Pond, Piscataquis County, T. 2, R. 13; inlet, a small unnamed stream rising in southwestern part of T. 2, R. 13, and flowing through the pond to Lobster Lake (outlet to West Branch of Penobscot River); length (approximate), one-fourth mile; maximum width, one-eighth mile; area of water surface, 0.10 square mile; drainage area not measured. Sheet 2, Maine State map.

Duck Pond, Piscataquis County, T. 7, R. 8 N. W. P.; inlet, short stream from west; outlet by short stream into Burden Pond, thence through Crooked Pond, Long Pond, and Sebec Lake to Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.10 square mile; drainage area not measured.

Duck Stream, Penobscot County; rises in Duck Pond in T. 4, N. D.; flows generally westward through Nicatous Lake to Nicatous Stream (tributary to Passadumkeag River, which flows to Penobscot River); length (approximate), 2½ miles; drainage area not measured. Sheet 7, Maine State map.

Dudley Brook, Aroostook County; rises in T. 7, R. 4; flows southeastward to East Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); receives the flow of an unnamed stream from the north; length (approximate), 6 miles; drainage area not measured. Sheet 6, Maine State map.

Duncan Pond, Somerset County, central Prentiss Township (T. 4, R. 4); inlet, a short unnamed stream from the north; outlet, a stream about 1½ miles long, flowing southward into Bald Brook (tributary South Branch of Penobscot River, which flows into West Branch of Penobscot River); length (approximate), three-fourths mile; maximum width, about one-third mile; area of water surface, 0.38 square mile; drainage area not measured. Sheet 2, Maine State map.

Dyer Brook, Aroostook County; rises in an unnamed pond in eastern Dyer Brook Township; flows southwestward to Fish Stream (tributary to Mattawamkeag River, which flows into Penobscot River); receives the flow of a number of small unnamed streams; length, about 6½ miles; drainage area not measured. Sheet 6, Maine State map.

East Branch Lake, Penobscot County, T. 3, R. 9; outlet, through East Branch of Seboeis Stream to Seboeis Stream (tributary to Piscataquis River, which flows into Penobscot River); length (approximate), 1½ miles; maximum width, 1½ miles; approximate area of water surface, 1.08 square miles; drainage area not measured. Sheets 6 and 7, Maine State map.

East Branch of Mattawamkeag River, Aroostook and Washington counties; rises in northern Smyrna Township, Aroostook County; flows generally southward to its junction with West Branch in Haynesville Township to form the Mattawamkeag (tributary to Penobscot River in Mattawamkeag Township, Washington County); receives the flow of Dudley Brook, Duck and Pleasant ponds, Skiticook Lake, and Beaver Brook; length (approximate), 27 miles; drainage area above junction with West Branch Mattawamkeag River, 158 square miles. Sheet 6, Maine State map.

East Branch of Penobscot River, Piscataquis and Penobscot counties; rises in Sink Pond, in T. 7, R. 11, Piscataquis County, at an elevation of about 850 feet above sea level; for the first half of its course it flows southeastward, but in the lower half takes an almost direct southerly course to its junction with Penobscot River in Medway Township, Penobscot County; receives the flow of Chamberlain Lake, Round Pond, Telos Lake, Webster and Bailey brooks, the overflow of the Grand Lakes, Seboeis River, and Wassataquoik Stream, besides the flow of innumerable smaller streams and ponds; length (approximate), 60 miles; drainage area at its junction with the Penobscot River in Medway Township, including Chamberlain Lake drainage area, 1,130 square miles. Gaging station at Grindstone. See page 56 of this report. Sheets 2 and 6, Maine State map.

East Branch of Pleasant River, Piscataquis County; rises in T. 4, R 12, flows southeastward for the first two-thirds of its course, then turns and flows slightly southwestward to its junction with the West Branch (in T. 5, R. 8) to form Pleasant River, which empties into the Piscataquis (tributary to Penobscot River); receives the flow of Gurnsey Brook, the overflow of Gauntlet Pond, Upper Ebeemee Lake, Ebeemee Lake, and Middle Brook; length (approximate), 28 miles; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

East Branch of Seboeis Stream, Penobscot County; rises in East Branch Lake in T. 3, R. 9; flows slightly southwestward through Seboeis Stream to Piscataquis River (tributary to Penobscot River); receives the overflow of Cedar Pond besides that of an unnamed pond on the east and an unnamed stream on the west; length (approximate), 8 miles; drainage area not measured. Sheets 6 and 7, Maine State map.

East Chair Pond, Piscataquis County, T. 7, R. 9 N. W. P.; outlet, by short stream into Long Pond, thence by Long Pond Stream through Onawa Lake, Onawa Stream, Sebec Lake, into Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.12 square mile; drainage area not measured.

East Messer Pond, Penobscot County, T. 5, R. 8 W. E. L. S.; outlet, by short stream into Little Spring Brook and Big Spring Brook (tributary to East Branch of Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Eaton Brook, Penobscot County; rises in northern Holden Township, at an elevation of about 180 feet; flows in a rather circuitous course westward and northwestward to Penobscot River in northern Brewer Township; receives the flow of perhaps six unnamed streams; length (approximate), 4½ miles; total fall, about 160 feet; drainage area not measured. Orland and Orono sheets, U.S.G.S.

Ebeemee Lake, Piscataquis County, T. 5, R. 9 and Brownville; inlet, East Branch of Pleasant River, which flows through the lake also to Piscataquis River (tributary to Penobscot River); length (approximate), 1½ miles; maximum width, one-half mile; approximate area of water surface, 2.04 square miles; drainage area, 87 square miles. Sheets 2, 3, 6, and 7, Maine State map.

Egg Pond, Penobscot County, Lincoln; outlet, by short stream through Caribou Pond, Long Pond, Cambolasse Pond, into Cambolasse Stream and Penobscot River; area of water surface, 0.13 square mile; drainage area not measured.

Elbow Lake, Penobscot County, Purchase 4 Township; inlet, overflow from North Twin Lake; outlet, through Quakish Lake and Shad Pond to West Branch of Penobscot River; length (approximate), less than 1 mile; maximum width, about three-fourths mile; dam at outlet of lake; drainage area not measured. Sheet 6, Maine State map.

Elbow Lake, Piscataquis County, T. 3, R. 10 W. E. L. S.; inlets, small stream from north and outlet from Tracy Pond; outlet by short stream into Katahdin Stream (tributary to West Branch of Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Ellis Stream, Piscataquis County; rises in T. 7, R. 14; flows eastward through second and first ponds to Chamberlain Lake (tributary through Round Pond and Telos Lake to Webster Brook, which flows through Grand Lakes to East Branch of Penobscot River); no tributaries; length (approximate), 10 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Elm Pond, Somerset County, T. 4, R. 16; inlet, Elm Stream, which flows through the pond to Seboomook Lake on West Branch of Penobscot River; length (approximate), 1 mile; maximum width, about two-thirds mile; approximate area of water surface, 0.90 square mile; drainage area not measured. Sheet 2, Maine State map.

Elm Stream, Somerset County; rises in T. 5, R. 18; flows southward and southeastward through Elm Pond in T. 4, R. 16 to Seboomook Lake on West Branch of Penobscot River; receives the flow of four small unnamed streams; length, about 16½ miles; drainage area not measured. Sheet 2, Maine State map.

Endless Lake, Penobscot County, T. 3, R. 9; inlet, from Seboois Lake; outlet, through Seboeis Stream to Piscataquis River (tributary to Penobscot River); length (approximate), 4 miles; maximum width, 1½ miles; approximate area of water surface, 2.57 square miles; present storage, 8 feet; additional available storage, 5 feet; drainage area at outlet, 66.5 miles. Sheets 6 and 7, Maine State map.

Eskatassis Pond, Penobscot County, Lowell and Burlington townships; inlets, two short unnamed streams; outlet, through a small unnamed pond to Passadumkeag River (tributary to Penobscot River); length (approximate), 2 miles; maximum width, 1¾ miles; approximate area of water surface, 1.36 square miles; present storage, 8 feet; drainage area not measured. Sheet 7, Maine State map.

Etna Pond, Penobscot County, Stetson, Etna, and Carmel townships; inlets, two unnamed streams; outlet, Souadabscook Stream (tributary to Penobscot River); length, about 1¾ miles; maximum width, three-fourths mile; area of water surface, 0.91 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Farrar Brook, Piscataquis County; rises in T. 1, R. 12; flows northeastward into Rainbow Pond (outlet through Nahmakanta Pond and Stream to Pemadumcook Lake on West Branch of Penobscot River); receives the flow of three short unnamed streams and the overflow of Female Pond; length (approximate), 6 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Felts Brook, Penobscot County; rises in western Holden Township, at an elevation of about 130 feet; flows northwestward to Penobscot River in Brewer Township; receives the flow of two short unnamed streams; length (approximate), 4½ miles; total fall, about 160 feet; drainage area not measured. Orono sheet, U.S.G.S.

Female Pond, Piscataquis County, T. 1, R. 12; inlet, from a small pond on the west; outlet, through Farrar Brook to Rainbow Pond (tributary through Nahmakanta Pond and Stream to Pemadumcook Lake on West Branch of Penobscot River); length (approximate), two-thirds mile; maximum width, one-fourth mile; area of water surface, 0.22 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Ferguson Lake, Penobscot County, Millinocket; inlet, water is diverted from West Branch Penobscot River by a dam at the outlet of Quakish Lake into Ferguson Lake, thence through the mill of the Great Northern Paper Co. into Millinocket Stream (tributary to West Branch of Penobscot River); area of water surface, 0.42 square mile; drainage area not measured.

Fields Pond, Penobscot County, northeastern Orrington Township; elevation, 105 feet; inlet, the overflow from Brewer Pond on the south; outlet, through Sedgeunkedunk Stream to Penobscot River in Brewer Township; length (approximate), two-thirds mile; maximum width, one-half mile; area of water surface, 0.29 square mile; drainage area not measured. Orland Bucksport, and Bangor sheets, U.S.G.S.

Finn Brook, Aroostook County; rises in northern Reed Township; flows generally southeastward to Mattawamkeag River (tributary to Penobscot River); no tributaries; length (approximate), 9 miles; drainage area not measured. Sheet 6, Maine State map.

First Pond, Piscataquis County, T. 7, R. 14; inlet, Ellis Stream, which flows through the pond to Chamberlain Lake (tributary through Round Pond and Telos Lake to Webster Brook, which flows through Grand Lake to East Branch of Penobscot River); length (approximate), 1 mile; maximum width, one-fourth mile; area of water surface, 0.27 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Fish Pond, Somerset County, T. 3, R. 3; inlet, a small stream about 2½ miles long from the west; outlet, into Alder Brook (tributary to South Branch of the Penobscot, which flows into West Branch of the Penobscot); maximum width, one-half mile; length (approximate), 1½ miles; area of water surface, 0.09 square mile; drainage area not measured. Sheet 2, Maine State map.

Fish Pond, Somerset County, east-central Bald Mountain Township; outlet to Hale Brook and South Branch Penobscot River (tributary to West Branch of Penobscot River); length (approximate), three-fourths mile; maximum width, about three-fourths mile; area of water surface, 0.48 square mile; drainage area not measured. Sheet 2, Maine State map.

Fish Pond, Somerset County, T. 5, R. 20 W. E. L. S.; inlets, two small streams from the north; outlet, by Fish Pond Stream into Foss Pond, thence by Dole Brook into North Branch of Penobscot River (tributary to West Branch of Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Fish Stream, Penobscot County; rises in southern Mount Chase Township; flows southeastward and eastward to West Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); receives the flow of Crystal Stream and Cold Brook, besides that of several other small streams and an unnamed pond in Patten Township; length (approximate), 15 miles; drainage area not measured. Sheet 6, Maine State map.

Fisher Pond, Piscataquis County, T. 2, R. 12; outlet, a small stream on the south to Caribou Lake (tributary to Chesuncook Lake on West Branch of Penobscot River); length (approximate), one-half mile; maximum width, about one-third mile; area of water surface, 0.05 square mile; drainage area not measured. Sheet 2, Maine State map.

Fitts Pond, Penobscot County, southeastern Clifton Township; elevation, 320 feet; inlets, two short unnamed streams from the south; outlet, through an unnamed stream to Chemo Pond (outlet through Blackman Stream to Penobscot River); between point of outlet and entrance to Chemo Pond, a distance of about 3½ miles, there is a fall of about 195 feet; area of water surface, 0.17 square mile; drainage area not measured. Orland and Orono sheets, U. S. G. S.

Flinn Pond, Aroostook County, on boundary between Benedicta Township and T. 1, R. 5; outlet, through Hersey Brook to Molunkus Stream (tributary to Mattawamkeag River, which flows into the Penobscot); length (approximate), 1 mile; maximum width, one-third mile; area of water surface, 0.27 square mile; drainage area not measured. Sheet 6, Maine State map.

Foley Pond, Somerset County, T. 4, R. 18; inlet, a small stream from an unnamed pond to the north; outlet, a stream about 1½ miles long flowing southeastward to Lane Brook (tributary to North Branch of Penobscot River, which in turn is tributary to West Branch of the Penobscot); length, about 1 mile; maximum width, one-third mile; area of water surface, 0.38 square mile; drainage area not measured. Sheet 2, Maine State map.

Folsom Pond, Penobscot County, central Lincoln Township; inlet, the overflow of Upper Pond from the south and a small unnamed pond on the northwest; outlet, through a small unnamed pond to Mattanacook Pond (outlet by stream of same name into Penobscot River); length (approximate), three-fourths mile; maximum width, less than one-half mile; approximate area of water surface, 0.26 square mile; controlled by a dam; drainage area not measured. Sheets 6 and 7, Maine State map.

Foss Pond, Penobscot County, north-central Kingsbury Township; outlet, through Thorn Brook to South Branch of Piscataquis River (tributary to the Piscataquis, which flows into the Penobscot); length (approximate), 1 mile; maximum width, about one-fourth mile; area of water surface, 0.14 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Fourth Lake, Piscataquis County, T. 7, R. 11; outlet, to Third Lake, Grand Lake, and East Branch of Penobscot River; length (approximate), 1½ miles; maximum width, a little over one-half mile; area of water surface, 0.32 quare mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Fourth Pond, Piscataquis County, T. 7, R. 8 N. W. P.; inlet, stream from east; outlet, through Burden Pond, Crooked Pond, Long Pond, and Sebec Lake, into Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.33 square mile; drainage area not measured.

Fowler Pond, Piscataquis County, T. 6, R. 9 W. E. L. S.; inlet, short stream from south; outlet, short stream into Trout Stream, thence into Grand Lake, East Branch of Penobscot River; area of water surface, 0.10 square mile; drainage area not measured.

Frost Pond, Piscataquis County, T. 6, R. 9; outlet, through Second Grand Lake to East Branch of Penobscot River; length (approximate), three-fourths mile; maximum width, one-fourth mile; area of water surface 0.05 square mile; drainage area not measured. Sheet 6, Maine State map.

Frost Pond, Piscataquis County, T. 3, R. 11; inlet, a small unnamed tributary from the northeast; outlet, an unnamed stream from the southeast to Ripogenus Lake on West Branch of Penobscot River; length (approximate), seven-eighths mile; maximum width, about one-half mile; area of water surface 0.34 square mile; drainage area not measured. Sheet 2, Maine State map.

Garland Pond, Piscataquis County, western Sebec Township; outlet, through a short unnamed stream to Piscataquis River (tributary to Penobscot River); length (approximate), three-fourths mile; maximum width, less than one-fourth mile; area of water surface, 0.04 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Gassabias Lake, Penobscot County, T. 41, M. D.; outlet, through Nicatous Lake to the stream of the same name (tributary through Passadumkeag River to Penobscot River); length (approximate), 1¾ miles; maximum width, 1½ miles; approximate area of water surface, 1.34 square miles; present storage, 6 feet; drainage area not measured. Sheet 7, Maine State map.

Gauntlet Pond, Piscataquis County, T. B, R. 10; outlet, East Branch of Pleasant River (tributary to Pleasant River, which joins the Piscataquis, a branch of Penobscot River); length (approximate), 1¼ miles; maximum width, less than 1 mile; area of water surface, 0.11 square mile; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

George Pond, Penobscot County, Hermon Township; inlet, Wheeler Stream, which passes through the pond to Souadabscook Stream (tributary to Penobscot River); elevation, 125 feet; the outlet has practically no fall, since it flows through a bog; length (approximate), one-half mile; maximum width, less than one-fourth mile; area of water surface, 0.08 square mile; drainage area not measured. Bangor sheet, U.S.G.S.

George Pond, Penobscot County, Holden Township, one-fourth mile west of East Holden; inlet, an unnamed stream about 1½ miles long; outlet, to Phillips Lake outlet (northern), (tributary to Long Pond, which has outlet through Moosehorn Creek, Dead River, and Orland River to Penobscot River); elevation, 170 feet; between point of outlet and junction with Phillips Lake Outlet (northern), a distance of perhaps one-fourth mile, there is a fall of about 10 feet; length, about one-fourth mile; width, about one-eighth mile; area of water surface, 0.03 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Gordon Brook, Penobscot County, Webster Township; flows northeastward for about 2 miles, then turns and flows northwestward to Mattawamkeag River (tributary to Penobscot River); no tributaries; length (approximate), 6½ miles; drainage area not measured. Sheet 6, Maine State map.

Gould Brook, Penobscot County; rises in western Mattamiscontis Township; flows southward and southeastward to Penobscot River; no tributaries; length (approximate), 4 miles; drainage area not measured. Sheet 7, Maine State map.

Grand Lake, Penobscot County, T. 7, R. 7; inlets, Seboeis Lake and a small unnamed pond; outlet, through Whitehouse and Snowshoe lakes to Seboeis River (tributary to East Branch of Penobscot River); length (approximate), 1 mile; maximum width, 1 mile; area of water surface, 2.44 square miles; drainage area not measured. See *Whitehouse Lake* and *Snowshoe Lake*. Sheet 6, Maine State map.

Grand Lake, Penobscot County, T. 6, R. 8, and Piscataquis County, T. 6, R. 9; inlets, the overflow of Second Grand Lake, Trout Brook, and several small unnamed streams; outlet, East Branch of Penobscot River; length (approximate), 3½ miles; maximum width, 1½ miles; approximate area of water surface, including Second Grand Lake, 6.63 square miles; present storage, 14 feet; additional available storage, 10 feet; drainage area at dam at outlet, includes Chamberlain Lake drainage area, 496 square miles. Sheet 6, Maine State map.

Grand Lakes; see *Snowshoe Lake*, *Whitehouse Lake*.

Grant Brook, Piscataquis County; rises in Rat Pond in T. 2, R. 9; flows westward and southward to Millinocket Lake and Shad Pond (tributary to West Branch of Penobscot River); length (approximate), 3 miles; drainage area not measured. Sheet 6, Maine State map.

Grapevine Pond, Piscataquis County, T. 7, R. 8 N. W. P.; inlet, stream from east through Upper Grapevine Pond; outlet, by small stream to Sebec Lake and Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.14 square mile; drainage area not measured.

Grass Pond, Aroostook County, Moro Plantation; inlet, small stream through Picked Mountain Pond from the south; outlet, by West Branch of Mattawamkeag River, through Rockabema Lake to Mattawamkeag River (tributary to Penobscot River); area of water surface, 0.10 square mile; drainage area not measured.

Great Works Stream, Penobscot County; rises in eastern Clifton Township; flows generally northwestward to Penobscot River in northwestern Bradley Township; receives the overflow of Parks Pond (through its northern outlet), Boynton Brook, and a number of short unnamed streams; length (approximate), 12 miles; drainage area not measured. Orono sheet, U.S.G.S., and sheet 7, Maine State map.

Green Pond, Aroostook County, Moro Plantation; inlet, small stream from southwest; outlet, by Alder Brook through Hale Lake to West Branch of Mattawamkeag River (tributary to Mattwamkeag River, which flows into Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Green Pond, Piscataquis County, T. 2, R. 12; outlet, a small stream on the west to Caribou Lake (tributary to Chesuncook Lake on West Branch of Penobscot River); length (approximate), one-half mile; maximum width, about one-half mile; area of water surface, 0.03 square mile; drainage area not measured. Sheet 2, Maine State map.

Green Pond, Piscataquis County, on boundary between Tps. 7, R. 10, and B, R. 11; outlet, through an unnamed stream about 2½ miles long to White Brook (tributary to West Branch of Pleasant River, which in turn is tributary to Pleasant River, a tributary of the Piscataquis, and which flows into Penobscot River); length (approximate), three-fourths mile; maximum width, less than one-half mile; area of water surface, 0.06 square mile; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

Greenleaf Pond, Piscataquis County, eastern Abbot Township; inlet, two short unnamed streams and the overflow of an unnamed pond; outlet, through Piscataquis River to Penobscot River; length (approximate), three-fourths mile; maximum width, one-third mile; area of water surface, 0.12 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Greenwood Ponds, Piscataquis County, on the town line between Elliottsville and Willimantic townships; outlet, through Onawa Lake to Long Pond Stream (tributary through Sebec Lake to Sebec River, which flows to Piscataquis River, a branch of Penobscot River); length (approximate), three-fourths mile; maximum width, one-fourth mile; area of water surface, 0.64 square mile; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Grindstone Pond, Piscataquis County, northern Willimantic Township; outlet through Wilson Stream to Sebec Lake; outlet to Sebec River, which flows into the Piscataquis, a branch of the Penobscot); length (approximate), three-fourths mile; maximum width, one-half mile; area of water surface, 0.04 square mile; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Gulch Brook, Hancock County; rises in southern Orland Township, at an elevation of 390 feet; flows northwestward into Alamoosook Lake (outlet, Orland River to Penobscot River); receives the flow of one small unnamed stream; length, about 3 miles; total fall, 370 feet; drainage area not measured. Orland sheet, U.S.G.S.

Gulliver Brook, Somerset County; rises in northern part of T. 4, R. 17; flows southeastward to its junction with West Branch of Penobscot River; receives the flow of four small unnamed streams from the east; length, about 7 miles; drainage area not measured. Sheet 2, Maine State map.

Gurnsey Brook, Piscataquis County; rises in T. B, R. 11; flows westward through B Pond to East Branch of Pleasant River (tributary to Pleasant River, which flows into the Piscataquis, a branch of the Penobscot); besides the overflow of B Pond, it receives the flow of 2 short unnamed streams; length (approximate), 7½ miles; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

Hale Brook, Somerset County; rises in Fish Pond, T. 4, R. 3; flows in a northeastward direction to its junction with South Branch of Penobscot River (tributary to West Branch of Penobscot River); receives the flow of Hale Pond from the north and several unnamed small ponds and streams; length, about 9 miles; drainage area not measured. Sheet 2, Maine State map.

Hale Lake, Aroostook County, Moro Plantation; inlets, stream from west through Green Pond and short stream from north; outlet, by Alder Brook to West Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); area of water surface, 0.11 square mile; drainage area not measured.

Hale Pond, Piscataquis County, T. 2, R. 10 W. E. L. S.; inlets, two small streams from the west; outlet, by short stream into West Branch of Penobscot River; area of water surface, 0.19 square mile; drainage area not measured.

Hale Pond, Somerset County, T. 3, R. 3; outlet, a small unnamed stream flowing into Hale Brook (tributary to South Branch of Penobscot River, a tributary of the West Branch of the Penobscot); length (approximate), three-fourths mile; maximum width; about one-half mile; area of water surface, 0.07 square mile; drainage area not measured. Sheet 2, Maine State map.

Half Moon Pond, Waldo County, extreme northeastern Searsport Township, inlet, a small unnamed stream from the north; outlet, an unnamed stream about 2½ miles long, flowing into Marsh River and Marsh Bay (tributary to Penobscot River); elevation, 328 feet; between point of outlet and junction with Marsh River, a distance of approximately 2½ miles, there is a fall of 248 feet; length (approximate), 1 mile; maximum width, about one-third mile; area of water surface, 0.26 square mile; drainage area not measured. Bucksport sheet, U.S.G.S.

Hammond Pond, Penobscot County, northwestern Hampden Township; this pond is formed by the junction of the Souadabscook with its western branch, flowing into Penobscot River; elevation, 121 feet; length, about one-half mile; maximum width, one-third mile; area of water surface, 0.16 square mile; drainage area no measured. Bucksport and Bangor sheets, U.S.G.S.

Hancock Pond, Hancock County, east-central Bucksport Township; inlets, two small unnamed streams; outlet, to Moosehorn Creek (tributary to Dead River, which flows to Orland River, a branch of the Penobscot River); elevation, 99 feet; between point of outlet and junction with Moosehorn Creek, a distance of perhaps one-half mile, there is a fall of approximately 35 feet; length, little more than one-half mile; maximum width, less than one-fourth mile; area of water surface, 0.09 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Hanson Pond, Hancock County, near the western boundary line of Dedham Township; inlet, from Saulter Pond; outlet, to Phillips Lake outlet (northern) (tributary to Long Pond, which has outlet through Moosehorn Creek to Dead River and Orland River and thus to Penobscot River); elevation, 240 feet; between point of outlet and junction with Phillips Lake outlet (northern), a distance of less than 1 mile, there is a fall of approximately 120 feet; length, about one-eighth mile; width (approximate), one-sixteenth mile; drainage area not measured. Orland sheet, U.S.G.S.

Hardy Pond, Piscataquis County, T. 4, R. 8 N. W. P.; inlets, two streams from north and one from west; outlet, by Schoodic Stream to Piscataquis River (tributary to Penobscot River); area of water surface, 0.28 square mile; drainage area not measured.

Harlow Pond, Piscataquis County, northeastern Parkman Township; inlet, Mill Stream, which flows through the pond and through North West Pond to Piscataquis River (tributary to Penobscot River); length (approximate), 1 mile; maximum width, one-third mile; approximate area of water surface, 0.16 square mile; present storage, 6 feet; drainage area not measured. Sheets 3 and 7, Maine State map.

Harriman Pond, Piscataquis County, western Sebec Township; outlet, through Alder Brook to Piscataquis River (tributary to Penobscot River); length (approximate), less than three-fourths mile; maximum width, about one-half mile; area of water surface, 0.11 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Harrington Lake, Piscataquis County, on the boundary between T. 4, R. 11, and T. 3, R. 11; inlets, Soper and Sandy brooks and overflow from an unnamed pond on the southeast; outlet, Ripogenus Stream to Ripogenus Lake on West Branch Penobscot River; length (approximate), 3 miles; maximum width, one-half mile; approximate area of water surface, 1.84 square miles; drainage area not measured. Sheet 2, Maine State map.

Hathorn Pond, Penobscot County, T. 4, R. 8 W. E. L. S.; outlet, by Little Spring Brook into East Branch of Penobscot River; area of water surface, 0.06 square mile; drainage area not measured.

Hawkins Brook, Washington County; rises in T. 8, R. 4; flows northward to Mattawamkeag River (tributary to Penobscot River); no tributaries; length (approximate), 6½ miles; drainage area not measured. Sheet 6, Maine State map.

Hay Brook, Penobscot County; rises in T. 1, R. 6; flows northwestward to Mill Brook (tributary to East Branch of Penobscot River); receives the flow of one short stream in the upper part of its course; length (approximate), 4½ miles; drainage area not measured. Sheet 6, Maine State map.

Hay Brook, Piscataquis County, T. 7, R. 10; flows almost directly southward to West Branch of Pleasant River (tributary to Pleasant River, which flows into the Piscataquis, a branch of Penobscot River); no tributaries; length (approximate), 2½ miles; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

Hay Brook, Piscataquis County, T. 7, R. 9; flows generally southward through Second Grand Lake to East Branch of Penobscot River; receives the flow of a short unnamed stream from the west; length, about 2½ miles; drainage area not measured. Sheet 6, Maine State map.

Hay Lake, Penobscot County, T. 6, R. 8; inlets, two small unnamed streams from the south and southwest; outlet, through Sawtelle Brook to Seboeis River (tributary to East Branch of Penobscot River); length (approximate), 2 miles; maximum width, three-fourths mile; area of water surface, 0.91 square mile; drainage area not measured. Sheet 6, Maine State map.

Hay Pond, Penobscot County, T. 6, R. 8; outlet, through Sawtelle Brook to Seboeis River (tributary to East Branch Penobscot River); length (approximate), 1½ miles; maximum width, one-half mile; area of water surface, 0.22 square mile; drainage area not measured. Sheet 6, Maine State map.

Hayden Pond, Somerset County, eastern Mayfield Township; outlet, through Kingsbury Pond to South Branch Piscataquis River (tributary to Piscataquis River, which flows into Penobscot River); length (approximate), five-eighths mile; maximum width, about one-half mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Heart Pond, Hancock County, central Orland Township; about one-fourth mile south of Craig Pond; inlet, a small unnamed brook; outlet, into Toddy Pond (outlet to Orland River, which flows into Penobscot River); elevation, 174 feet; between point of outlet and its junction with Toddy Pond, a distance of less than one-fourth mile, there is a fall of about 15 feet; length, about one-half mile; maximum width, less than one-half mile; area of water surface, 0.12 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Hebron Pond, Piscataquis County, central Monson Township; outlet, to Davis Stream (tributary to Wilson Stream, which flows through Sebec Lake to Sebec River, a branch of the Piscataquis, a tributary of the Penobscot); length (approximate), a little less than 3 miles; maximum width, three-fourths mile; approximate area of water surface, 1.13 square miles, controlled by dam; drainage area not measured. Sheets 3 and 7, Maine State map.

Hedgehog Pond, Piscataquis County, T. 8, R. 10; inlet, the overflow of Trout Pond; outlet, through Long Pond to Long Pond Stream (tributary through Onawa and Sebec Lakes to Sebec River, a tributary of the Piscataquis, which flows into Penobscot River); length (approximate), 1½ miles; maximum width, 1 mile; area of water surface, 0.08 square mile; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Hemlock Stream, Penobscot County; rises in north-central Lagrange Township; flows southeastward to Penobscot River in Argyle Township; no tributaries; length (approximate), 12 miles; drainage area not measured. Sheet 7, Maine State map.

Henderson Pond, Piscataquis County, on boundary between Tps. 1, R. 11, and A, R. 11; outlet, Pratt Brook to Middle Joe Mary Lake (tributary through Lower Joe Mary Lake to Pemadumcook Lake on West Branch of Penobscot River); length (approximate), 1 mile; maximum width, little less than 1 mile; area of water surface, 0.37 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Hermon Pond, Penobscot County, southwestern Hermon Township; inlets, overflow from Tracy, Patten, and Ben Annis ponds; outlet, Souadabscook Stream which enters the pond from the west, flowing through it to Hammond Pond, from which it flows eastward to Penobscot River; elevation, 122 feet; length, about 1½ miles; maximum width, about three-fourths mile; area of water surface, 0.72 square mile; drainage area not measured. Bangor sheet, U.S.G.S.

Hersey Brook, Aroostook County; rises on boundary between Tps. Benedicta and 1, R. 5; flows southeastward through Molunkus Lake to Mattawamkeag River (tributary to Penobscot River); receives the overflow of Finn Pond and several short unnamed streams; length (approximate), 6½ miles; drainage area not measured. Sheet 6, Maine State map.

Hilton Ponds, Piscataquis County, Kingsbury; inlet, one short stream from southwest; outlet, by short stream Bog Brook, thence into Thorn Brook and South Branch of Piscataquis River (tributary to Penobscot River); area of water surface, 0.08 square mile; drainage area not measured.

Holbrook Pond, Piscataquis County, on boundary between Tps. 3, R. 11, and 2, R. 11; inlets, two small unnamed streams from the south; outlet, a short unnamed stream from the north about 1 mile long flowing to West Branch of Penobscot River; length (approximate), 1 mile; maximum width, three-fourths mile; area of water surface, 0.25 square mile; drainage area not measured. Sheet 2, Maine State map.

Holbrook Pond, Penobscot County, eastern Holden Township; elevation, 200 feet; inlets, three short unnamed streams; outlet, through Davis and Chemo ponds to Blackman Stream (tributary to Penobscot River); length (approximate), 1½ miles; maximum width, one-third mile; approximate area of water surface, 0.46 square mile; drainage area not measured. Orono and Orland sheets, U.S.G.S.

Holland Pond, Penobscot County, Alton; outlet, by McKechnie Brook into Birch Stream (tributary to Penobscot River); area of water surface, 0.12 square mile; drainage area not measured.

Horseshoe Pond, Hancock County, T. 35 M. D.; inlet, one short stream from north; outlet, Nicatous Stream through Nicatous Lake to Passadumkeag River (tributary to Penobscot River); area of water surface, 0.39 square mile; drainage area not measured.

Horseshoe Pond, Piscataquis County, T. 8, R. 10; outlet, through Little Wilson and Wilson ponds to Wilson Stream (tributary through Sebec Lake to Sebec River, a tributary of Piscataquis River, which in turn flows into Penobscot River); length (approximate), 1½ miles; maximum width, less than one-half mile; area of water surface, 0.31 square mile; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Hot Pond, on the Penobscot-Piscataquis County line, between T. 6, R. 7, and T. 6, R. 6; outlet, through Seboeis River to East Branch of Penobscot River; length (approximate), 1 mile; maximum width, two-thirds mile; area of water surface, 0.30 square mile; drainage area not measured. Sheet 6, Maine State map.

Hot Brook Lake, Washington County, T. 8, R. 4, and Aroostook County, Bancroft Township; inlets, 2 short unnamed streams from the south; outlet, through Baskahegan Stream to Mattawamkeag River (tributary to Penobscot River); length (approximate), 4 miles; maximum width, 1 mile; area of water surface, 2.53 square miles; drainage area not measured. Sheet 6, Maine State map.

Hothole Brook, Hancock County; rises in central Orland Township, at an elevation of 320 feet; flows northwestward into Hothole Pond (outlet to Dead River, which flows into Orland River, a tributary of Penobscot River); tributaries, several unnamed streams from the east; length (approximate), 3 miles; total fall, about 285 feet; drainage area not measured. Orland sheet, U.S.G.S.

Hothole Pond, Hancock County, northern Orland Township; inlets, Hothole Brook and an unnamed stream on the north about 2 miles long; outlet, Dead River to Orland River (tributary to Penobscot River); elevation, 35 feet; length, about one-half mile; maximum width, one-fourth mile; area of water surface, 0.09 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Hot Pistol Pond, Penobscot County, T. 3, N. D.; inlet, the overflow of Second Pistol Pond; outlet, through Passadumkeag River to Penobscot River; length (approximate), 1¾ miles; maximum width, 1 mile; area of water surface, 1.34 square miles; drainage area not measured. Sheet 7, Maine State map.

Houston Brook, Piscataquis County; rises in Houston Pond in T. 7, R. 9; flows eastward to West Branch of Pleasant River (tributary to Pleasant River, which is tributary to the Piscataquis, a branch of Penobscot River); receives the flow of an unnamed stream from the south; length (approximate), 6 miles; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

Houston Pond, Piscataquis County, T. 7, R. 9; inlet, the overflow of Benson Ponds and one short unnamed stream from the north; outlet, through Houston Brook to West Branch of Pleasant River (tributary to Pleasant River, which is tributary to the Piscataquis, a branch of Penobscot River); length (approximate), 2 miles; maximum width, about 1¼ miles; approximate area of water surface, 1.19 square miles; present storage, 13 feet; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

Hoyt Brook, Penobscot County; rises in northern Lagrange Township; flows southeastward to Penobscot River; no tributaries; length (approximate), 12 miles; drainage area not measured. Sheet 7, Maine State map.

Hudson Pond, Piscataquis County, T. 6, R. 10 W. E. L. S.; inlets, two small streams from north; dam at outlet; outlet, by short stream into Webster Brook (tributary to East Branch of Penobscot River); area of water surface, 0.16 square mile; drainage area not measured.

Hurd Pond, Hancock County, northwestern Dedham Township; inlet, an unnamed stream 2 miles long, the outlet of Moulton Pond; outlet, to Phillips Lake (outlet to Long Pond, which has outlet through Moosehorn Creek to Dead River, a tributary of Orland River, which flows to the Penobscot); elevation, 274 feet; between the point of outlet and its entrance to Phillips Lake, a distance of less than one-half mile, the fall is 51 feet; length (approximate), one-half mile; maximum width, less than one-fourth mile; area of water surface, 0.06 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Hurd Pond, Piscataquis County, T. 2, R. 10 W. E. L. S.; inlets, two small streams from the northwest and two small streams from the southwest; dam at outlet; outlet, by small stream into West Branch of Penobscot River; area of water surface, 1.05 square miles; drainage area not measured.

Hurd Pond Piscataquis County, T. 6, R. 15; inlets, two small unnamed streams from the north and east; outlet, to Loon Lake, to Caucomgomuc Lake (tributary to Chesuncook Lake on West Branch of Penobscot River); length (approximate), two-thirds mile; maximum width, about one-half mile; area of water surface, 0.76 square mile; drainage area not measured. Sheet 2, Maine State map.

Hurricane Brook, Somerset County; rises in T. 5, R. 20; flows southeastward to its junction with Dole Brook (tributary of North Branch of Penobscot River, a tributary of West Branch of the Penobscot); no tributaries; length, about 3 miles; drainage area not measured. Sheet 2, Maine State map.

Hurricane Pond, Somerset County, T. 5, R. 20 W. E. L. S.; inlets, two short streams from the north, one from the east, and one from the west; outlet, by Hurricane Brook into Dole Brook, thence into North Branch of Penobscot River (tributary to West Branch of Penobscot River); area of water surface, 0.5 square mile; drainage areas are not measured.

Hussey Pond, Piscataquis County, Blanchard; outlet, by short stream into Thorn Brook and South Branch of Piscataquis River (tributary to Penobscot River); area of water surface, 0.06 square mile; drainage area not measured.

Jackson Brook Lake, Aroostook County, on boundary between Brookton Township and T. 10, R. 3; outlet, to Baskahegan Lake (outlet through Baskahegan Stream to Mattawamkeag River, which flows into Penobscot River); length (approximate), 2 miles; maximum width, less than 1 mile; area of water surface, 1.08 square miles; drainage area not measured. Sheet 6, Maine State map.

Jackson Pond, Piscataquis County, on boundary between T. 3, R. 10, and T. 3, R. 11; inlet, an unnamed stream from the west; outlet, to Kidney Pond (outlet to Sourdnahunk Stream, which flows to West Branch of Penobscot River); length (approximate), one-fourth mile; maximum width, one-fourth mile; area of water surface, 0.03 square mile; drainage area not measured. Sheet 2, Maine State map.

Jacob Buck Pond, Hancock County, north-central Bucksport Township; inlet, a brook less than one-fourth mile long from the north; outlet, a stream about 2½ miles long, whose junction with the outlet of Williams Pond forms an unnamed tributary flowing into Orland River (tributary to Penobscot River); elevation, 205 feet; between point of outlet and junction with Williams Pond outlet, a distance of 2½ miles, there is a fall of about 155 feet; length (approximate), three-fourths mile; maximum width, less than three-fourths mile; area of water surface, 0.29 square mile; drainage area not measured. Orland and Bucksport sheets, U.S.G.S.

Jenkins Brook, Washington County; rises in T. 8, R. 3; flows southward and southeastward to Baskahegan Lake (outlet through Baskahegan Stream to Mattawamkeag River, which flows into Penobscot River); receives the flow of four short unnamed streams; length (approximate), 6 miles; drainage area not measured. Sheet 6, Maine State map.

Jerry Pond, Penobscot County, Millinocket, T. 1 N., R. 7, and T. A, R. 7; outlet, an unnamed stream about 2½ miles long, which receives the flow of Schoodic Stream and which joins the West Branch of Penobscot River in the pond (about 1½ miles long), formed by the dam about 1½ miles below the outlet of Shad Pond; length (approximate), 1½ miles; maximum width, about one-half mile; area of water surface, 0.12 square mile; drainage area not measured. Sheet 6, Maine State map.

Joe Mary Brook, Piscataquis County; rises in a small unnamed pond in southwestern part of T. A, R. 10; flows eastward and northeastward to Upper Joe Mary

Lake (outlet through Middle and Lower Joe Mary to Pemadumcook Lake on West Branch of Penobscot River); receives the flow of perhaps five unnamed streams; length (approximate), 3¾ miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Joe Mary Lakes; see *Upper Joe Mary Lake*, *Middle Joe Mary Lake*, and *Lower Joe Mary Lake.*

Jones Pond, Penobscot County, Ts. 7 and 8, R. 8; outlet, through Seboeis Lake and Grand Lakes to Seboeis River (tributary to East Branch of Penobscot River); receives the flow of several unnamed streams; length (approximate), five-eighths mile; maximum width, about one-half mile; drainage area not measured. Sheet 6, Maine State map.

Jones Pond, Somerset County, central Bald Mountain Township (T. 4, R. 3); outlet a small stream about 3½ miles long, flowing north to Bald Brook (tributary to South Branch of Penobscot, which flows into the West Branch of Penobscot River); length (approximate), 1 mile; maximum width, one-third mile; area of water surface, 0.62 square mile; drainage area not measured. Sheet 2, Maine State map.

Katahdin Lake, Penobscot County, T. 3, R. 8; inlets, three small unnamed streams; outlet, through Katahdin Stream to Wassataquoik Stream (tributary to East Branch of Penobscot River); length (approximate), 1⅓ miles; maximum width, about seven-eighths mile; approximate area of water surface, 1.02 square miles; drainage area not measured. Sheet 6, Maine State map.

Katahdin Pond, Piscataquis County, T. 2, R. 9; outlet, to Compass and River Ponds, which discharge to West Branch of Penobscot River; length (approximate), 2 miles; maximum width, less than 1 mile; approximate area of water surface, 0.64 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Katahdin Pond, Piscataquis County, T. 3, R. 10 W. E. L. S.; inlets, short stream from the north, which is outlet of Elbow Pond, stream from east and one from south; outlet, by Katahdin Stream to West Branch of Penobscot River; area of water surface, 0.03 square mile; drainage area not measured.

Katahdin Stream, Penobscot County; rises in Katahdin Lake in T. 3, R. 8; flows westward to Wassataquoik Stream (tributary to East Branch of Penobscot River); receives the flow of an unnamed stream from the south; length (approximate), 3 miles; drainage area not measured. Sheet 6, Maine State map.

Kelly Pond, Piscataquis County, T. 2, R. 12 W. E. L. S.; inlet, small stream from southeast; outlet, by Caribou Stream to Caribou Lake, thence by Chesuncook Lake to West Branch of Penobscot River; area of water surface, 0.08 square mile; drainage area not measured.

Kenduskeag River, Penobscot County; rises in eastern Dexter Township; flows southeastward through Pleasant and Mill ponds in Garland township, and through Corinth, Kenduskeag, Glenbury, and Bangor townships to Penobscot River; besides the overflow of Pleasant and Mill ponds, it receives the flow of Baker and Lancaster brooks, Black Stream, and innumerable short unnamed streams; length (approximate), 35 miles. Drainage area at mouth and including all of the drainage of Black Stream, 214 square miles. A number of years ago an artificial cut was made for log driving through a low divide between Souadabscook Stream and Black Stream, entering the Kenduskeag about 7 miles above Bangor. During high stages in the Souadabscook a portion of its waters finds its way through the artificial cut into the Kenduskeag. At low stages in the Souadabscook all the flow continues down its own channel. It is believed that all of the flow of the Black Stream is into the Kenduskeag and none into the Souadabscook. Gaging station near Bangor. See page 96 of this report. Sheets 3 and 7, Maine State map.

Kidney Pond, Piscataquis County, T. 3, R. 10; inlet, from Rocky Pond; outlet, to Sourdnahunk Stream (tributary to West Branch of Penobscot River); length (approximate), one-fourth mile; maximum width, one-fourth mile; area of water surface, 0.03 square mile; drainage area not measured. Sheet 2, Maine State map.

Kingsbury Pond, Somerset County, Mayfield and Brighton Place townships; inlets, the overflow of Hayden Pond from the north, besides three short unnamed streams and a small unnamed pond; outlet, through South Branch of Piscataquis River to Piscataquis River (tributary to Penobscot River); length (approximate), 2½ miles; maximum width, three-fourths mile; approximate area of water surface, 0.91 square mile; present storage, 10 feet; more storage available; drainage area not measured. Sheets 3 and 7, Maine State map.

Kingsley Stream, Penobscot County; rises in extreme southern Etna Township; flows with two sharp bends in a general northeasterly course to its junction with Souadabscook Stream (tributary to Penobscot River); receives the flow of three unnamed streams; length, about 2 miles; drainage area not measured. Sheets Nos. 3 and 7, Maine State map.

Knowlton Pond, Piscataquis County, T. 3, R. 10 W. E. L. S.; inlets, three streams from the north; outlet, by Foss Brook into West Branch of Penobscot River; area of water surface, 0.06 square mile; drainage area not measured.

Lancaster Brook, Penobscot County; rises in extreme southern part of Hudson Township, at an elevation of 150 feet; flows southeastward to Kenduskeag Stream (tributary to Penobscot River); receives the flow of a short unnamed stream from the east; length (approximate), 4½ miles; total fall, 50 feet; drainage area not measured. Bangor sheet, U.S.G.S.

Lane Brook, Somerset County; rises in east-central Hammond Township; flows southwestward to its junction with South Branch of Penobscot River (tributary to West Branch of Penobscot River); in the upper part of its course it flows through two small unnamed ponds; length, about 7 miles; drainage area not measured. Sheet 2, Maine State map.

Lane Brook, Somerset County; rises in a small unnamed pond in T. 4, R. 18; flows southward and eastward to its junction with North Branch of Penobscot River, whose union with the South Branch forms the West Branch of Penobscot River; receives the overflow of Foley Pond from the northwest and a short unnamed stream in the upper part of its course; length (approximate), 3½ miles; drainage area not measured. See also Big Lane Brook. Sheet 2, Maine State map.

Leadbetter Ponds (2), Piscataquis County, T. 7, R. 11, and T. 7, R. 12; outlets, two short unnamed streams which join, forming a stream about 3 miles long that enters Chamberlain Lake (outlet through Round Pond and Telos Lake to Webster Brook, which flows through Grand Lakes to East Branch of Penobscot River); each pond is about three-fourths mile long and one-half mile wide; area of water surface of pond in R. 11, 0.28 square mile; of pond in R. 12, 0.07 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Leavitt Pond, Piscataquis County, T. 1, R. 11 W. E. L. S.; inlet, short stream from the northwest; outlet, by Pratt Brook into Mud Pond, thence by Cooper Brook through Jo-Mary and Pemadumcook Lakes into West Branch of Penobscot River; area of water surface, 0.08 square mile; drainage area not measured.

Lilly Pond, Aroostook County, Moro Plantation; outlet, by small stream to Alder Brook and West Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); area of water surface, 0.02 square mile; drainage area not measured.

Lily Pad Pond, Piscataquis County, T. 3, R. 10 W. E. L. S.; inlets, one short stream from west and outlet stream of Beaver Pond; outlet, by short stream into Sourdnahunk Stream (tributary to West Branch of Penobscot River); area of water surface, 0.01 square mile; drainage area not measured.

Little Birch Stream, Penobscot County; rises in eastern Bradley Township; flows northwestward to Sunkhaze Stream (tributary to Penobscot River); receives the flow of a short unnamed stream from the east about 1½ miles from its mouth; length (approximate), 6 miles; drainage area not measured. Orono sheet, U.S.G.S., and sheet 7, Maine State map.

Little Eskatassis Pond, Penobscot County, Burlington; inlet, short stream from north; outlet, by short stream to Eskatassis Pond, thence by short stream to Passadumkeag River (tributary to Penobscot River); area of water surface, 0.13 square mile; drainage area not measured.

Littlefield Pond, Piscataquis County, T. 6, R. 9 W. E. L. S.; outlet, by short stream into Trout Stream, thence into Grand Lake, East Branch of Penobscot River; area of water surface, 0.02 square mile; drainage area not measured.

Little Hastings Pond, Piscataquis County, T. 6, R. 9 N. W. P.; outlet, by short brook into Hastings Brook (tributary to West Branch of Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Little Lane Brook, Somerset County; rises in T. 4, R. 17; flows southeastward to its junction with North Branch Penobscot River (tributary to West Branch of Penobscot River); receives the flow of an unnamed stream about 3 miles long from the east; length about 5 miles; drainage area not measured. Sheet 2, Maine State map.

Little Lane Stream, Somerset County; rises in T. 4, R. 18; flows southward to North Branch of Penobscot River (tributary to West Branch of Penobscot River); receives in the upper part of its course the flow of two small streams; length, about 7½ miles; drainage area not measured. Sheet 2, Maine State map.

Little Lobster Lake, Piscataquis County, T. 3, R. 14; inlets, two small streams from the north and northeast; outlet, a short stream about 1½ miles long emptying into Lobster Lake (outlet to West Branch of Penobscot River); length (approximate), 1 mile; maximum width, one-half mile; area of water surface, 0.38 square mile; drainage area not measured. Sheet 2, Maine State map.

Little Lyford Pond, Piscataquis County, T. 7, R. 10 N. W. P.; outlet, by small stream through Big Lyford Pond to West Branch of Pleasant River, thence through Pleasant River to Piscataquis River (tributary to Penobscot River); area of water surface, 0.02 square mile; drainage area not measured.

Little Madagascal Pond, Penobscot County, Lee and T. 3, R. 1 N. B. P. P.; inlet, short stream from southeast; outlet, by short stream through Madagascal Pond to Madagascal Stream and Passadumkeag River (tributary to Penobscot River); area of water surface, 0.2 square mile; drainage area not measured.

Little Pine Pond, Piscataquis County, T. 3, R. 14; outlet, a small unnamed stream to West Branch of Penobscot River; length (approximate), one-half mile; maximum width, about one-third mile; area of water surface, 0.13 square mile; drainage area not measured. Sheet 2, Maine State map.

Little Pond, Piscataquis County, T. 7, R. 12; outlet to Chamberlain Lake, which has outlet through Round Pond and Telos Lake to Webster Brook, which flows through Grand Lakes to East Branch of Penobscot River; length (approximate), three-fourths mile; maximum width three-fourths mile; area of water surface, 0.49 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Little Pond, Hancock County, southwestern Orland Township; outlet to Meadow Brook, which flows through Alamoosook Lake to Orland River (tributary to Penobscot River); elevation, 80 feet; practically no difference in elevation between point of outlet and junction with Meadow Brook; length, about three-eighths mile; width (approximate), one-eighth mile; drainage area not measured. Orland sheet, U.S.G.S.

Little Pushaw Pond, Penobscot County, on boundary between Corinth and Hudson townships; inlet, Pushaw Stream, which flows through the pond to Stillwater River (west channel of Penobscot River); maximum width, 1 mile; approximate area of water surface, 0.68 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Little Round Pond, Penobscot County, Lincoln; outlet, by short stream to Cold Stream Pond, thence through Cold Stream to Passadumkeag River (tributary to Penobscot River); area of water surface, 0.14 square mile; drainage area not measured.

Little Scot Brook, Piscataquis County; rises in T. 5, R. 14; flows northeastward to its junction with Caucomgomuc Stream (tributary to Chesuncook Lake on West Branch of the Penobscot); receives the flow of several short unnamed streams from the west; length (approximate), 6 miles; drainage area not measured. Sheet 2, Maine State map.

Little Seboeis River, Penobscot County; rises in T. 4, R. 7; flows southwestward to East Branch of Penobscot River; receives the flow of several unnamed streams; length (approximate), 7 miles; drainage area not measured. Sheet 6, Maine State map.

Little Wilson Pond, Piscataquis County, Greenville; outlet, by short stream through Wilson Pond into Wilson Stream, Sebec Lake, into Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.08 square mile; drainage area not measured.

Little Wilson Stream, Piscataquis County; rises in central Shirley Township; flows eastward to Wilson Stream (tributary through Sebec Lake to Sebec River, a tributary of the Piscataquis, which in turn flows into Penobscot River); no tributaries; length (approximate), 7 miles; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Lobster Lake, Piscataquis County, Northeast Carry, T. 3, R. 14, East Middlesex, and X towns; inlets, streams from Little Lobster Lake and Cranberry and Duck ponds; outlet, a small stream on the north about 2 miles long flowing into West Branch of Penobscot River; length (approximate), 4½ miles; maximum width, about 2 miles; approximate area of water surface, 4.80 square miles; an island about 1½ miles long and three-fourths mile wide lies in the center of this lake; drainage area not measured. Sheet 2, Maine State map.

Logan Brook, Somerset County; rises in T. 4, R. 17; flows southeastward into Seboomook Lake on West Branch of Penobscot River; no tributaries; length (approximate), 6½ miles; drainage area not measured. Sheet 2, Maine State map.

Long Lake, Aroostook County, Oakfield; inlets, small streams through Spaulding Lake on the east; outlet, through short stream to East Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); area of water surface, 0.24 square mile; drainage area not measured.

Long Pond, Hancock County, northeastern Bucksport Township; inlets, Phillips Lake outlet (northern), Copeland Brook, and several small unnamed streams; outlet, Moosehorn Creek to Dead River (tributary to Orland River, which flows to Penobscot River); elevation, 66 feet; length, about 2½ miles; maximum width, less than one-half mile; area of water surface, 0.41 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Long Pond, Penobscot County, extreme northern part of Lincoln Township; inlet, the overflow of Caribou Pond; outlet, through a number of unnamed ponds to Penobscot River; length (approximate), 1½ miles; maximum width, one-half mile; approximate area of water surface, 0.69 square mile; controlled by a dam; drainage area not measured. Sheet 6, Maine State map.

Long Pond, Piscataquis County, Bowdoin College grant, Elliottsville (T. 8, R 9), and T. 7, R. 9; inlets, the overflow of Hedgehog Pond from the west and an unnamed pond from the east; outlet, through Long Pond Stream, Onawa Lake to Sebec Lake (outlet by Sebec River to the Piscataquis, a tributary of the Penobscot); length (approximate), a little less than 3 miles; maximum width, about 1 mile; approximate area of water surface, 3.08 square miles; about 4 feet storage available; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Long Pond, Piscataquis County, on boundary between T. 1, R. 11, and T. A, R. 11; inlet, the overflow of a small pond from the north; outlet, from the west, through Wadleigh and Rainbow ponds into Nahmakanta Lake (outlet to Pemadumcook Lake on West Branch of Penobscot River); length (approximate), 2 miles; maximum width, about one-half mile; area of water surface, 0.50 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Long Pond, Piscataquis County, T. 6, R. 9 W. E. L. S.; inlet, short stream from north; outlet, short stream into Trout Stream, thence into Grand Lake, East Branch of Penobscot River; area of water surface, 0.06 square mile; drainage area not measured.

Long Pond, Piscataquis County, T. 8, R. 10 N. W. P.; inlet, stream from Brown, Fourth, Burden, and Crooked Ponds; outlet, by Onawa Stream to Sebec Lake and Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.62 square mile; drainage area not measured.

Long Pond, Somerset County, central Dole Township (T. 3, R. 5); outlet, from the north to Dole Pond, to Dole Brook, which empties into North Branch of Penobscot River (tributary to West Branch of Penobscot River); length (approximate), 1½ miles; maximum width, one-half mile; area of water surface, 0.46 square mile; drainage area not measured. Sheet 2, Maine State map.

Long Pond Stream, Piscataquis County; rises in Long Pond in northeastern Elliottsville Township; flows southwestward for about 5 miles, then turns and flows southeastward through Onawa and Sebec lakes to Sebec River (tributary to the Piscataquis, a branch of Penobscot River); receives the overflow of Onawa Lake and two or three unnamed streams; length (approximate), 15 miles; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Longley Brook, Piscataquis County; rises in T. 6, R. 13; flows southeastward to its junction with Umbazooksus Stream (tributary to Chesuncook Lake on West Branch of Penobscot River); no tributaries; length (approximate), about 1½ miles; drainage area not measured. Sheet 2, Maine State map.

Longley Pond, Piscataquis County, T. 6, R. 13; inlet, a small unnamed stream about 1 mile long from the west; outlet, to Umbazooksus Lake (outlet, Umbazooksus Stream to Chesuncook Lake on West Branch of Penobscot River); length (approximate), 1½ miles; maximum width, little less than 1 mile; approximate area of water surface, 0.80 square mile; present storage, 7 feet; drainage area not measured. Sheet 2, Maine State map.

Loon Lake, Piscataquis County, T. 6, R. 15; inlets, Whitney Brook, from the east, the overflow of Hurd Pond from the north, and two short unnamed streams from the south; outlet, Loon Stream to Caucomgomuc Lake (outlet to Chesuncook Lake on West Branch of Penobscot River); length (approximate), 5 miles; maximum width, about three-fourths mile; approximate area of water surface, 1.59 square miles; dam feasible; drainage area not measured. Sheet 2, Maine State map.

Loon Stream, Piscataquis County; rises in Loon Lake, T. 6, R. 15; flows northeastward and northward into Caucomgomuc Lake (outlet to Chesuncook Lake on West Branch of Penobscot River); receives the flow of Scott Brook from the south; length (approximate), 3 miles; drainage area not measured. Sheet 2, Maine State map.

Lord Brook, Hancock County; rises in T. 3, N. D.; flows southwestward about 1 mile, then turns and flows northward to Passadumkeag River (tributary to Penobscot River); receives the flow of a short unnamed stream about 1 mile from its source; length (approximate), 6 miles; drainage area not measured. Sheet 7, Maine State map.

Lords Brook, Penobscot County, southeastern Summit Township; flows northwestward to Passadumkeag River (tributary to Penobscot River); receives the flow of several short unnamed streams; length (approximate), 5½ miles; drainage area not measured. Sheet 7, Maine State map.

Lost Pond, Piscataquis County, T. 3, R. 10; inlet, a small unnamed stream from the north; outlet, to West Branch of Penobscot River; length (approximate), one-fourth mile; maximum width, one-eighth mile; area of water surface, 0.03 square mile; drainage area not measured. Sheet 2, Maine State map.

Lost Pond, Piscataquis County, on boundary between T. 7, R. 12, T. 7, R. 13, and T. 6, R. 13; outlet to Chamberlain Lake (outlet through Round Pond, Telos Lake to Webster Brook, which flows through Grand Lakes to East Branch of Penobscot River); approximate length, one-third mile; maximum width, one-fourth mile; area of water surface, 0.07 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Lower Hastings Brook, Aroostook County; rises in T. 7, R. 4; flows southward and southwestward to West Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); receives the flow of an unnamed stream from the west about 5½ miles long; length (approximate), 7 miles; drainage area not measured. Sheet 6, Maine State map.

Lower Joe Mary Lake, Piscataquis County, T. 1, R. 10, T. 1, R. 9, and T. A, R. 10; inlet, the overflow of Middle Joe Mary Lake; outlet, to Pemadumcook Lake on West Branch of Penobscot River; length (approximate), 3¼ miles; maximum width, three-fourths mile; approximate area of water surface, 3.56 square miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Lunksoos Brook, Penobscot County; rises in an unnamed pond in T. 4, R. 7; flows southeastward to East Branch of Penobscot River; receives the flow of a short unnamed stream; length (approximate), 2½ miles; drainage area not measured. Sheet 6, Maine State map.

Lunksoos Pond, Penobscot County, T. 4, R. 7 W. E. L. S.; outlet, by short stream into East Branch of Penobscot River; area of water surface, 0.72 square mile; drainage area not measured.

Lyford Pond; see *Big Lyford Pond.*

McGann Bog, Hancock County, northern Bucksport Township; a small pond; inlet, the drainage of the bog in which it lies; outlet, Copeland Brook to Long Pond (outlet through Moosehorn Creek to Dead River, which flows into Orland River, a branch of Penobscot River); elevation, 180 feet; between point of outlet and junction with Long Pond, a distance of about three-fourths mile, the fall is about 60 feet; length, about one-eighth mile; width (approximate), one-eighth mile; area of water surface, 0.02 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Macwahoc Lake, Aroostook County, Shermand and T. 3, R. 4 W. E. L. S.; inlets, two small streams from north; outlet, by Macwahoc Stream to Molunkus Stream (tributary to Mattawamkeag River which flows into Penobscot River); area of water surface, 0.59 square mile; drainage area not measured.

Madagascal Pond, Penobscot County, northeastern Burlington Township; inlet, Coffee Brook; outlet, through Madagascal Stream to Passadumkeag River (tributary to Penobscot River); length (approximate), 1¼ miles; maximum width, 1 mile; approximate area of water surface, 0.99 square mile; present storage, 7 feet; drainage area not measured. Sheet 7, Maine State map.

Madagascal Stream, Penobscot County; rises in Madagascal Pond in northeastern Burlington Township; flows generally southward to its junction with Passadumkeag River (tributary to Penobscot River); receives the flow of a short unnamed stream about 4 miles from its source; length (approximate), 9 miles; drainage area not measured. Sheet 7, Maine State map.

Mansell Pond, Penobscot County, Alton; outlet, by short stream into McKechnie Brook and Birch Stream (tributary to Penobscot River); area of water surface, 0.08 square mile; drainage area not measured.

Marble Brook, Piscataquis County; rises in Marble Pond in central Blanchard Township; flows southeastward to Piscataquis River (tributary to Penobscot River); receives the flow of Bog Stream from the north, besides that of an unnamed pond from the south and a short unnamed stream from the northwest; length (approximate), 5 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Marble Pond, Penobscot County, T. 5, R. 8 W. E. L. S.; outlet, short stream into Bowlin Pond, thence by Bowlin Stream into East Branch of Penobscot River; area of water surface, 0.06 square mile; drainage area not measured.

Marble Pond, Piscataquis County, western Blanchard Township; inlet, from Bald Mountain Pond; outlet, through Marble Brook to Piscataquis River (tributary to Penobscot River); length (approximate), one-third mile; maximum width, one-third mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Marr Pond, Piscataquis County, north-central Sangerville Township; inlet, a short unnamed stream from the west; outlet, through Black Stream to Piscataquis River (tributary to Penobscot River); length (approximate), three-fourths mile; maximum width, less than one-half mile; area of water surface, 0.14 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Marsh Brook; see *Big Marsh Brook.*

Marsh River, Waldo County; rises in central Searsport Township, at an elevation of 580 feet; flows southeastward for 3 miles of its course, then turns abruptly and flows northwestward for about 6 miles with numerous bends and sharp turns, thence almost due north (with the exception of one great bend) for about 4 miles through a stretch of swamp land to its junction with Marsh Creek (tributary to Marsh Bay on Penobscot River); receives the flow of about 9 unnamed streams; length (approximate), 13 miles; total fall, 580 feet; drainage area not measured. Bucksport sheet, U.S.G.S.

Marsh Stream, Waldo County; rises in northern Jackson Township; flows southwestward with numerous bends through Jackson, Monroe, Frankfort, and Winterport Townships to its junction with Marsh River in Marsh Bay, on Penobscot River; tributaries, Moulton Stream, North Branch, the outlet of Toddy Pond (Swanville Township) and perhaps five unnamed streams; length, about 19½ miles; drainage area not measured. Sheets Nos. 3 and 7, Maine State map.

Mattagondas Stream, Penobscot County; rises in north-central Carroll Township; flows in a rather circuitous course generally northwestward to Mattawamkeag Stream (tributary to Penobscot River); receives about four unnamed streams; length (approximate), 17 miles; drainage area not measured. Sheet 6, Maine State map.

Mattakeunk Pond, Penobscot County, southwestern Lee Township; inlets, two short unnamed streams; outlet, through Mattakeunk Stream to Mattawamkeag River (tributary to Penobscot River); length (approximate), 2 miles; maximum width, 1¼ miles; approximate area of water surface, 0.81 square mile; controlled by a dam; drainage area not measured. Sheets 6 and 7, Maine State map.

Mattakeunk Stream, Penobscot County; rises in a small unnamed pond in eastern Springfield Township; flows northwestward to Mattawamkeag River (tributary to Penobscot River); receives three unnamed streams; length (approximate), 15 miles; drainage area not measured. Sheet 6, Maine State map.

Mattamiscontis Lakes (2 connected), Penobscot County, T. 3, R. 9; each pond receives the flow of a short stream about 1½ miles long; outlet, Mattamiscontis Stream to Penobscot River; length (approximate) of lake farthest north, 2 miles; maximum width, 1 mile; length (approximate) of southernmost lake, 1½ miles; maximum width, 1 mile; area of water surface, upper pond, 2.95 square miles; lower pond, 1.18 square miles; drainage area not measured. Sheets 6 and 7, Maine State map.

Mattamiscontis Stream, Penobscot County; rises in Mattamiscontis Lakes in T. 3, R. 9; flows slightly southeastward into Penobscot River in Mattamiscontis Township; tributaries, Sam Ayers Stream and Big Marsh Brook and stream from

South Branch Lake; length (approximate), 10 miles; drainage area not measured. Sheets 6 and 7, Maine State map.

Mattanacook Pond, Penobscot County, western Lincoln Township; inlets, Dead Stream from the east and the overflow from Crooked, Folson, and Upper ponds from the southeast; outlet, Mattanacook Stream to Penobscot River in northwestern Chester Township; length (approximate), 1½ miles; maximum width, three-fourths mile; approximate area of water surface, 0.54 square mile; controlled by a dam; drainage area not measured. Sheets 6 and 7, Maine State map.

Mattanacook Stream, Penobscot County; rises in the pond of the same name; flows northwestward to Penobscot River; no tributaries; length (approximate), 1½ miles; drainage area not measured. Sheet 6, Maine State map.

Mattaseunk Lake, Aroostook County, Molunkus Township (T. A, R. 5); inlets, Whyman and Carlton brooks from the north; outlet, Mattaseunk Stream to Penobscot River; length (approximate), 3 miles; maximum width, less than 1 mile; approximate area of water surface, 1.51 square miles; drainage area not measured. Sheet 6, Maine State map.

Mattaseunk Stream, Aroostook County; rises in Mattaseunk Lake; flows southward and southwestward to Penobscot River; one tributary, unnamed stream from the east; length (approximate), 4 miles; drainage area not measured. Sheet 6, Maine State map.

Mattawamkeag Lake, Aroostook County, Island Falls and T. 4, R. 3; inlet, West Branch Mattawamkeag River, which flows through the lake to Mattawamkeag River (tributary to Penobscot River); length (approximate), 6½ miles; maximum width, 2½ miles; approximate area of water surface, 6.02 square miles; present storage, 9 feet; additional available storage, 1 foot; drainage area not measured. Sheet 6, Maine State map.

Mattawamkeag River is formed by the junction of its East and west branches in Haynesville Township, Aroostook County; flows southeastward through Aroostook and Washington counties to Penobscot River; receives the flow of Scraggrook and Big Battle brooks, Baskahegan Stream, Smith, Bog, Hawkins, and Finn brooks, Wytopitlock Stream, Mud Brook, Mattagondas and Molunkus streams, Gordon Brook and Mattakeunk Stream; length (approximate), from the junction of its East and West branches, 45 miles; drainage area, about 1,500 square miles. Gaging station at Mattawamkeag. See pages 68 and 158 of this report. Sheet 6, Maine State map.

Mattawamkeag River, East Branch; see *East Branch of Mattawamkeag.*

Mattawamkeag River, West Branch; see *West Branch of Mattamawkeag.*

Meadow Brook, Hancock County; rises in northern Penobscot Township, at an elevation of 160 feet; flows northwestward through a stretch of swamp land and enters Alamoosook Lake (outlet to Orland River, which flows to Penobscot River); tributaries, six unnamed streams and stream from Little Pond; length, about 5½ miles; total fall, about 140 feet; drainage area not measured. Orland sheet, U.S.G.S.

Meadow Brook, Penobscot County; rises in T. 2, R. 7; flows southeastward to East Branch of Penobscot River; receives the flow of three small unnamed streams; length (approximate), 5½ miles; drainage area not measured. Sheet 6, Maine State map.

Messer Pond, Penobscot County, T. 5, R. 8 W. E. L. S.; outlet, by Little Spring Brook into Big Spring Brook (tributary to East Branch of Penobscot River); area of water surface, 0.07 square mile; drainage area not measured.

Medunkeunk Lake, Penobscot County, T. 2, R. 9; outlet, Medunkeunk Stream to Penobscot River; length (approximate), 1½ miles; maximum width, a little more than 1 mile; approximate area of water sufrace, 0.46 square mile; drainage area not measured. Sheet 6, Maine State map.

Medunkeunk Stream, Penobscot County; rises in Nedunkeunk Lake in T. 2, R. 9; flows southward to Penobscot River in southwestern Chester Township; receives the flow of perhaps four unnamed streams ranging in length from 3 to 8 miles; length (approximate), 12 miles; drainage area not measured. Sheet 6, Maine State map.

Middle Brook, Piscataquis County; rises in T. 5, R. 9; flows southward to East Branch of Pleasant River (tributary to Pleasant River, which flows into Piscataquis River, a branch of the Penobscot); receives from the west an unnamed stream about 8 miles long; length (approximate), 4 miles; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

Middle Joe Mary Lake, Penobscot County, Indian 3 Township; inlets, Pratt Brook and overflow of Upper Joe Mary Lake; outlet, through Lower Joe Mary Lake to Pemadumcook Lake on West Branch Penobscot River; length (approximate), 3 miles; maximum width, about 1 mile; approximate area of water surface, 1.65 square miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Mile Pond, Piscataquis County, T. 8, R. 14; outlet, through Allagash Stream and Allagash Lake to Chamberlain Lake (outlet through Round Pond and Telos Lake to Webster Brook, which flows through Grand Lakes to East Branch of Penobscot River); length (approximate), three-fourths mile; maximum width, one-fourth mile; area of water surface, 0.20 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Mill Brook, Penobscot County; rises in T. 3, R. 7; flows southward to East Branch of Penobscot River; receives the flow of Swift and Hay brooks, besides that of nine unnamed streams; length, about 12 miles; drainage area not measured. Sheet 6, Maine State map.

Mill Creek, Penobscot County; rises in Sweets Pond in southern Orrington Township, at an elevation of 188 feet; flows northwestward for about 1 mile, then southwestward to Penobscot River; receives the flow of about 5 unnamed streams; length (approximate), 5 miles; total fall, 127 feet; drainage area not measured. Bucksport sheet, U.S.G.S.

Mill Pond, Penobscot County, south-central Garland Township; inlet, a short unnamed stream from the north and Kenduskeag River, which flows through it to Penobscot River; length (approximate), 1 mile; maximum width, one-third mile; area of water surface, 0.15 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Mill Stream, Hancock County; rises in west-central Bucksport Township, at an elevation of 200 feet; flows southeastward about 1½ miles, thence almost directly south through about 1 mile of swamp land, entering Silver Lake, through which it flows to its junction with Penobscot River at the town of Bucksport; before passing through Silver Lake it receives the flow of two small unnamed streams; length (approximate), 5 miles; total fall, 200 feet; drainage area not measured. Bucksport sheet, U.S.G.S.

Mill Stream, Piscataquis County; rises in western Parkman Township; flows northeastward through Harlow and North West ponds to Piscataquis River (tributary to Penobscot River); receives the flow of about five short unnamed streams and the overflow of North West and Harlow ponds; length (approximate), 10 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Millinocket Lake, Piscataquis County, Tps. 1 and 2, R. 9, and Penobscot County, Tps. 1 and 2, R. 8; inlets, Big Mud Brook, Sandy Stream, Grant Brook, and overflow of Bottle Pond; outlet, Millinocket Stream to Shad Pond on West Branch of Penobscot River; at extreme high water overflows into Ambejejus Lake. This lake is extremely irregular in shape and rugged in outline; average length, about 4½ miles; maximum width, about 4 miles; approximate area of water surface, 13.95 square miles; controlled by a dam; drainage area not measured. Sheet 6, Maine State map.

Millinocket Stream, Penobscot County; rises in Millinocket Lake in T. 1, R. 8; flows in a slight southeasterly direction to Shad Pond on West Branch of Penobscot River; receives the flow of Smith Brook and several unnamed streams from the west, besides a large part of the flow of Quakish Lake when the canal is in operation (see p. 33 of this report); length (approximate), 7½ miles; drainage area not measured. Sheet 6, Maine State map.

Mink Pond, Piscataquis County, T. 2, R. 9 W. E. L. S.; inlet, one short stream from the north; outlet, by Katahdin Pond, thence by Sandy Stream through Millinocket Lake and Millinocket Stream into West Branch of Penobscot River; area of water surface, 0.04 square mile; drainage area not measured.

Mitchell Pond, Hancock County, southwestern Dedham Township; outlet, to Phillips Lake (outlet through Phillips Lake outlet to Long Pond, which has outlet through Moosehorn Creek to Dead River, a tributary of Orland River, which flows into Penobscot River); elevation, 587 feet; between point of outlet and entrance to Phillips Lake, a distance of about 2 miles, there is a fall of 364 feet; length, about one-eighth mile; width (approximate), about one-eighth mile; area of water surface, 0.02 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Mohawk Brook, Penobscot County; rises in northeastern Charleston Township, flows southeastward to Pushaw Stream (tributary to Stillwater River, the west channel of Penobscot River at Orson and Marsh islands); receives two short unnamed streams in the extreme upper part of its course; length (approximate), 12 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Molunkus Lake, Aroostook County, Tps. 1, R. 5, and A, R. 5 (Molunkus); inlets; Hersey Brook and several short unnamed streams; outlet, a stream 1 mile long flowing southeastward to Molunkus Stream (tributary to Mattawamkeag River, which flows into Penobscot River); length (approximate), 3½ miles; maximum width, 1 mile; approximate area of water surface, 1.59 square miles; drainage area not measured. Sheet 6, Maine State map.

Molunkus Stream, Penobscot County; rises in southeastern Patten Township; flows southeastward through Aroostook County to its junction with Mattawamkeag River (tributary to Penobscot River) in Washington County; receives the overflow of Plunket Pond and Molunkus Lake, besides that of many short unnamed streams; length (approximate), 35 miles; drainage area not measured. Sheet 6, Maine State map.

Monson Pond, Piscataquis County, north-central Monson Township; inlet from Spectacle Pond; outlet to Davis Stream (tributary to Wilson Stream, which flows thence through Sebec Lake to Sebec River, a tributary of Piscataquis River, which flows into Penobscot River); length (approximate), 1 mile; maximum width, three-fourths mile; approximate area of water surface, 0.51 square mile; several feet of storage available; drainage area not measured. Sheets 3 and 7, Maine State map.

Moose Pond, Piscataquis County; on boundary between T. 5, R. 13, and T. 5, R. 12; inlets, overflow from Cuxabexis Lake and Duck Pond; outlet, to Chesuncook Lake on West Branch of Penobscot River; length (approximate), about 1¼ miles; maximum width, about two-thirds mile; area of water surface, 0.54 square miles; drainage area not measured. Sheet 2, Maine State map.

Moosehorn Creek, Hancock County; rises in Long Pond, in northeastern Bucksport Township, at an elevation of 66 feet; flows southward through a bog to its junction with Dead River (tributary to Orland River, which flows into Penobscot River); tributaries, two unnamed streams and stream from Hancock Pond; length, about 2¼ miles; total fall, approximately 31 feet; drainage area not measured. Orland sheet, U.S.G.S.

Moosehorn Stream, Piscataquis County; rises in a small unnamed pond in T. 3, R. 14; flows north and northwestward to its junction with West Branch of Penobscot River; receives the flow of two small unnamed streams from the east; length (approximate), 3½ miles; drainage area not measured. Sheet 2, Maine State map.

Mortson Brook, Penobscot County; rises in southeastern Summit Township; flows west of south to Olamon Stream (tributary to Penobscot River); receives the flow of a short unnamed stream from the east; length (approximate), 5 miles; drainage area not measured. Sheet 7, Maine State map.

Moulton Pond, Hancock County, Bucksport and Dedham Townships; outlet, to Hurd Pond (outlet to Phillips Lake and through north outlet of Phillips Lake to Long Pond, which has outlet through Moosehorn Creek to Dead River, a tributary of Orland River, which in turn flows into Penobscot River); elevation, 473 feet; between the point of outlet and entrance to Hurd Pond, a distance of about 2 miles, there is a fall of about 200 feet; length (approximate), one-half mile; maximum width, less than one-fourth mile; area of water surface, 0.07 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Moulton Stream, Waldo County; rises in west-central Jackson Township; flows southwestward about 2½ miles to its junction with Marsh Stream (tributary to Penobscot River); receives the flow of two unnamed streams; length (approximate), 4½ miles; drainage area not measured. Sheets Nos. 3 and 7, Maine State map.

Mountain Pond, Piscataquis County, T. 8, R. 10 N. W. P. and T. A. R. 13 W. E. L. S.; outlet, by short stream into Upper Wilson Pond, Wilson Stream, Sebec Lake and Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.20 square mile; drainage area not measured.

Mountain Pond, Piscataquis County, T. 8, R. 10 N. W. P.; inlet, short stream from north; outlet, by short stream to West Branch of Pleasant River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.05 square mile; drainage area not measured.

Mud Brook, Penobscot County; rises in central Prentiss Township; flows northwestward about 3 miles, thence turns and flows northeastward through Mud Lake to Mattawamkeag River (tributary to Penobscot River); receives the flow of two unnamed streams; length (approximate), 6 miles; drainage area not measured. Sheet 6, Maine State map.

Mud Brook. See *Big Mud Brook.*

Mud Lake, Penobscot County, southern Drew Township (T. 7, R. 4); inlet, Mud Brook, which flows through the lake to Mattawamkeag River (tributary to Penobscot River); length (approximate), 1 mile; maximum width, three-fourths mile; approximate area of water surface, 0.21 square mile; present storage, 8 feet; drainage area not measured. Sheet 6, Maine State map.

Mud Pond, Aroostook County, Oakfield, and T. 4, R. 3; inlet, a very small unnamed stream from the south; outlet, through Skiticook Lake to East Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); length (approximate), one-fourth mile; maximum width, one-eighth mile; area of water surface, 0.24 square mile; drainage area not measured. Sheet 6, Maine State map.

Mud Pond, Aroostook and Penobscot Counties, Moro Pl. and T. 6, R. 6 W. E. L. S.; inlet, small stream through Pleasant Pond on west; outlet, by West Branch of Mattawamkeag River through Rockabema Lake to Mattawamkeag River (tributary to Penobscot River); area of water surface, 0.16 square mile; drainage area not measured.

Mud Pond, Hancock County, Bucksport Township; elevation, 173 feet; inlet, from Browns Pond to the south; outlet, through Brewer and Fields ponds to Sedgeunkedunk River (tributary to Penobscot River); between point of outlet and entrance to Brewer Pond, a distance less than three-fourths mile, there is a fall of 66 feet; area of water surface, 0.05 rquare mile; drainage area not measured. Orland, Bucksport, and Bangor sheets, U.S.G.S.

Mud Pond, Hancock County, Dedham Township; outlet, to Second Pond (outlet to Phillips Lake, whose north outlet passes to Long Pond, which has outlet through Moosehorn Creek to Dead River, a tributary of Orland River, which flows into Penobscot River); elevation, 420 feet; between its outlet and the point where it enters

Second Pond, a distance of approximately one-fourth mile, there is a fall of 45 feet; length (approximate), one-fourth mile; width, about one-sixteenth mile; area of water surface, 0.02 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Mud Pond, Penobscot County, T. 7, R. 8; outlet, through Second Lake to East Branch of Penobscot River; length (approximate), 1 mile; maximum width, one-half mile; area of water surface, 0.06 square mile; drainage area not measured. Sheet 6, Maine State map.

Mud Pond, Penobscot County, T. 6, R. 8; inlets, three small unnamed streams from the west; outlet, through Sawtelle Brook to Seboeis River (tributary to East Branch of Penobscot River); length (approximate), 2 miles; maximum width, about three-fourths mile; area af water surface, 0.58 square mile; drainage area not measured. Sheet 6, Maine State map.

Mud Pond, Penobscot County, west-central Oldtown Township; elevation, 117 feet; outlet, a short unnamed stream to Pushaw Stream (tributary to Stillwater River, the west channel of Penobscot River); length (approximate), 1½ miles; maximum width, three-fourths mile; approximate area of water surface, 0.54 square mile; drainage area not measured. Bangor and Orono sheets, U.S.G.S.

Mud Pond, Piscataquis County, Ts. 1 and 2, R. 13; inlet, a small unnamed stream from the south about one-half mile long; outlet, an unnamed stream about 1½ miles long from the north, flowing into Black Stream (tributary through Ragged Stream to Caribou Lake, which discharges to Chesuncook Lake on West Branch of Penobscot River); length (approximate), one-half mile; maximum width, about one-eighth mile; area of water surface, 0.08 square mile; drainage area not measured. Sheet 2, Maine State map.

Mud Pond, Piscataquis County, T. 4, R. 12; inlets, three small unnamed streams from the north, southeast, and south; outlet, a small unnamed stream about 2 miles long, flowing into Chesuncook Lake on West Branch of Penobscot River; length (approximate), 1½ miles; maximum width, about 1 mile; area of water surface, 0.90 square mile; drainage area not measured. Sheet 2, Maine State map.

Mud Pond, Piscataquis County, T. 6, R. 12; inlets, two short unnamed streams; outlet, to Chamberlain Lake (outlet through Round Pond and Telos Lake to Webster Brook, which flows through Grand Lakes to East Branch of Penobscot River); approximate length, 1 mile; maximum width, three-fourths mile; area of water surface, 0.97 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Mud Pond, Piscataquis County, T. 7, R. 8 N. W. P.; outlet, by short stream into Long Pond through Sebec Lake into Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.10 square mile; drainage area not measured.

Mud Pond, Piscataquis County, Ts. A and 1, R. 10 W. E. L. S.; inlets, short stream from north, short stream from west, and Pratt Brook from west; outlet, by short stream into Cooper Brook through Middle Joe Mary Lake, Lower Joe Mary Lake, Pemadumcook Lake, into West Branch of Penobscot River; area of water surface, 0.46 square mile; drainage area not measured.

Mud Pond, Piscataquis County, T. 9, R. 15; inlet, the overflow of Crescent Pond; outlet, a short unnamed stream emptying into Allagash Stream (tributary through Allagash Lake to Chamberlain Lake, which has outlet through Round Pond and Telos Lake to Webster Brook, which flows through Grand Lakes to East Branch of Penobscot River); length (approximate), 1 mile; maximum width, three-fourths mile; approximate area of water surface, 0.26 square miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Muskrat Ponds, Piscataquis County, T. 1, R. 11 W. E. L. S.; inlets, short stream from west and outlet stream of Penobscot Pond from south; outlet, through Wadleigh Pond, Pollywog Pond. Nahmakanta Stream into Pemadumcook Lake and West

Branch Penobscot River; area of water surface, 0.14 square mile; drainage area not measured.

Nahmakanta Lake, Piscataquis County, Tps. 1 and 2, R. 11; inlets, Bean Brook and overflow from Rainbow Lake, besides the flow of several small unnamed streams; outlet, Nahmakanta Stream to Pemadumcook Lake on West Branch of Penobscot River; length (approximate), 3½ miles; maximum width, about seven-eighths mile; approximate area of water surface, 2.32 square miles; present storage, 8 feet; drainage area not measured. Sheets 2 and 6, Maine State map.

Nahmakanta Stream, Piscataquis County; rises in Nahmakanta Lake, in T. 1, R. 11; flows westward to Pemadumcook Lake on West Branch Penobscot River; receives the flow of Tumble Down Dick Stream from the south; length (approximate), 3½ miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Narrow Pond, Piscataquis County, T. 8, R. 14; outlet to Allagash Stream (tributary through Allagash Lake to Chamberlain Lake, which has outlet through Round Pond and Telos Lake to Webster Brook, and thence through Grand Lake to East Branch of Penobscot River); length (approximate), 1½ miles; maximum width, one-third mile; area of water surface, 0.32 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Nicatous Lake, Penobscot County, Tps. 3 N. D., 40 M. D., and 41 M. D.; inlets, Duck Stream and streams from West and Gassabias lakes and Porter Pond; outlet, through Nicatous Stream to Passadumkeag River (tributary to Penobscot River); length (approximate), 7½ miles; approximate area of water surface, 8.82 square miles; present storage, 10 feet; drainage area not measured. Sheet 7, Maine State map.

Nicatous Stream, Penobscot County; rises in Nicatous Lake in T. 3 N. D.; flows northwestward to Passadumkeag River (tributary to Penobscot River); no tributaries; length (approximate), 4½ miles; drainage area not measured. Sheet 7, Maine State map.

Niger Stream, Somerset County; rises in T. 4, R. 16; flows southeastward to Seboomook Lake on West Branch of Penobscot River; no tributaries; length, about 6 miles; drainage area not measured. Sheet 2, Maine State map.

No. 3 Pond, Penobscot County, T. 3, R. 1; outlet, through Passadumkeag River to Penobscot River; length (approximate), 1½ miles; maximum width, three-fourths mile; approximate area of water surface, 0.76 square mile; drainage area not measured. Sheets 6 and 7, Maine State map.

No. 4 Pond, Piscataquis County, Willimantic; outlet, by short stream through Davis Pond and Wilson Stream to Sebec Lake and Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Nollesemic Lake, Penobscot County, Hopkins Academy and Long A towns; outlet, an unnamed stream about 3 miles long flowing to Shad Pond on West Branch of Penobscot River; length (approximate), 2½ miles; maximum width, one-half mile at its northern end; approximate area of water surface, 1.10 square miles; drainage area not measured. Sheet 6, Maine State map.

North Branch of Marsh Stream, Waldo County; rises in southern Knox Township; flows northwest through Knox, Brooks, Monroe, and Frankfort Townships to its junction with Marsh Stream (tributary to Penobscot River); in addition to the flow of perhaps six small unnamed streams, it receives the overflow from Round, Thistle, and Toddy (Swansville Township) ponds; length, about 15 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

North Branch of Penobscot River, Somerset County; rises in T. 6, R. 19; flows southeastward to its junction with South Branch of Penobscot River to form the West Branch of Penobscot River; principal tributaries, Northeast Branch of Penobscot River, Norris Brook, Truesdale Pond, Dole Brook, and Lane Brook; length, about 26 miles; drainage area above junction with South Branch, 272 square miles. Sheet 2, Maine State map.

North Branch of Sunkhaze Stream, Hancock County; rises near boundary between Amherst and 32 MD. townships; flows northwestward to Sunkhaze Stream (tributary to Penobscot River); receives the flow of a short unnamed stream about 1 mile from its source; length (approximate), 12 miles; drainage area not measured. Sheet 7, Maine State map.

Northeast Branch of Penobscot River, Somerset County; rises in T. 6, R. 18; for the first 6 miles of its course flows in an easterly direction, and after passing through Abaconetie Bog flows in a general southwesterly direction to its junction with North Branch of Penobscot River (tributary to West Branch of the Penobscot) in T. 5, R. 18; it receives the flow of about 12 unnamed streams ranging in length from 1 mile to 4 miles; length, about 15 miles; drainage area not measured. Sheet 2, Maine State map.

Northwest Pond, Piscataquis County, on boundary between Parkman and Sangerville townships; inlet, Mill Stream, which flows through the pond to Piscataquis River (tributary to Penobscot River); length (approximate), 1¾ miles; maximum width, 1¼ miles; area of water surface, 0.67 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Northwest Pond, Piscataquis County, T. 4, R. 9; connected by a "thoroughfare" with Seboeis Lake (outlet through Seboeis Stream and Endless Lake to Piscataquis River, which flows into the Penobscot); area of water surface included in Seboeis Lake. See page 183 of this report.

Nulhedus Brook, Somerset County; rises in Nulhedus Pond, in T. 4, R. 16; flows southward into Seboomook Lake on West Branch of Penobscot River; receives the flow of an unnamed stream about 5 miles long from the west; length, about 4¾ miles; drainage area not measured. Sheet 2, Maine State map.

Nulhedus Pond, Somerset County, T. 4, R. 16; inlets, two small unnamed streams from the west; outlet, Nulhedus Brook to Seboomook Lake on West Branch of Penobscot River; length (approximate), 1½ miles; maximum width, one-half mile; approximate area of water surface, 0.72 square mile; drainage area not measured. Sheet 2, Maine State map.

Nutupsemic Brook, Penobscot County; rises in T. 7, R. 6; flows southwesterly to the outlet of Hot Pond, entering Seboeis River (tributary to East Branch of Penobscot River); receives the flow of one unnamed stream about 5 miles long from the east; length (approximate), 6 miles; drainage area not measured. Sheet 6, Maine State map.

Oakes Bog, Piscataquis County, Shirley; outlet, by short stream into Bog Stream, Bald Mountain Stream, North Branch of Piscataquis River (tributary to Penobscot River); area of water surface, 0.08 square mile; drainage area not measured.

Olamon Stream, Penobscot County; rises in southern Greenfield Township; flows northwestward to Penobscot River in northern Greenwich Township; receives the flow of Mortson Brook about 1½ miles from its source, besides that of several short unnamed streams; length, about 15 miles; drainage area not measured. Sheet 7, Maine State map.

Onawa Lake, Piscataquis County, southeastern Elliottsville Township; inlets, Long Pond Stream and overflow from Greenwood Pond, besides a short unnamed stream from the north; outlet, Long Pond Stream to Sebec Lake (outlet to Sebec River, which is tributary to the Piscataquis, a branch of Penobscot River); length (approximate), 3¾ miles; maximum width, 1¼ miles; approximate area of water surface, 2.22 square miles; controlled by a dam; additional storage available, 10 feet; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Orland River, Hancock County; rises in Toddy Pond, Orland Township, at an elevation of 158 feet; flows northwestward about 3 miles, passing through Alamoosook Lake, and 1 mile below turns abruptly and flows southward to Penobscot River;

principal tributaries, Meadow Brook and Dead River, both of which enter Alamoosook Lake, and Phillips Lake outlet (northern); length, about 8 miles; total fall, about 108 feet; drainage area not measured. Orland sheet, U.S.G.S.

Otter Chain Ponds, Penobscot County, southwestern Milford Township; elevation, 100 feet; inlet, a short unnamed stream from the east; outlet, through a short unnamed stream to Penobscot River in northwestern Bradley Township; largest pond is a little less than 1 mile long and less than one-sixteenth mile wide; drainage area not measured. Orono sheet, U.S.G.S.

Otter Pond, Aroostook County, T. 3, R. 4; inlet, a small unnamed stream on the south; outlet, through Caribou Lake and Sly Brook to West Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into the Penobscot); length (approximate), two-thirds mile; area of water surface, 0.16 square mile; drainage area not measured. Sheet 6, Maine State map.

Otter Pond, Piscataquis County, T. 8, R. 14 W. E. L. S.; outlet, by short stream into Allagash Stream, thence through Allagash Lake into Chesuncook Lake (tributary to East Branch of Penobscot River); area of water surface, 0.02 square mile; drainage area not measured.

Parks Pond, Penobscot County, central Clifton Township; elevation, 255 feet; has two outlets, the northern passing through Great Works Stream to Penobscot River and the western through Chemo Pond to Blackman Stream, and thence to Penobscot River; length (approximate), one-half mile; maximum width, one-fourth mile; area of water surface, 0.10 square mile; drainage area not measured. Oronos heet, U.S.G.S., and sheet 7, Maine State map.

Passadumkeag River, Penobscot County; rises in southeastern Lee Township; flows in an extremely circuitous course, generally southward, and thence westward to join the Penobscot in Passadumkeag Township; receives the waters of No. 3 Pond, Brown Brook, Taylor Brook, Spring Pond, and Hot Pistol Pond, Nicatous Stream, Trout Brook, Lord Brook, Madagascal Stream, of Eskatassis Ponds, Lords Brook, and Cold Stream; length (approximate), 38 miles; drainage area, 383 square miles. Sheets 6 and 7, Maine State map.

Passamagormuc Lake, Piscataquis County, T. 1, Rs. 9 and 10 W. E. L. S.; inlets, four short streams from west; outlet, by short stream into West Branch of Penobscot River; area of water surface, 0.44 square mile; drainage area not measured.

Patten Pond, Penobscot County, Newburg and Hampden townships; inlet, a small unnamed stream from the south; outlet, an unnamed stream about 1¼ miles long, flowing to Ben Annis Pond (outlet to Hermon Pond and Souadabscook River, which flows into Penobscot River); elevation, 130 feet above sea level; between point of outlet and Ben Annis Pond, a distance of about 1¼ miles through a bog, there is about 8 feet fall; maximum width, about one-third mile; length (approximate), one-third mile; area of water surface, 0.06 square mile; drainage area not measured. Bucksport and Bangor sheets, U.S.G.S.

Peaked Mountain Pond, Penobscot County, T. 4, R. 7 W. E. L. S.; outlet, by short stream into Seboeis River (tributary East Branch of Penobscot River); area of water surface, 0.05 square mile; drainage area not measured.

Pemadumcook Lake, Piscataquis County, T. 1, Rs. 9 and 10, and Penobscot County, Indian 3 Township; inlets, Nahmakanta Stream, Joe Mary Lake outlet, and West Branch of the Penobscot, through Ambejejus Lake; outlet, West Branch of Penobscot River, through North and South Twin lakes; length (approximate), about 4 miles; maximum width, about 1½ miles; approximate area of water surface, including North and South Twin and Ambejejus lakes, 24.9 square miles; present storage, 25 feet; drainage area not measured. Sheets 2 and 6, Maine State map.

Penobscot Lake, Somerset County, Hammond, Prentiss, and Dole townships and T. 4, R. 5; inlet, a small stream about two-thirds mile long from an unnamed pond in

T. 4, R. 5; outlet, to South Branch of Penobscot River (tributary to West Branch of Penobscot River); maximum width, about 1 mile; approximate area of water surface, 1.96 square miles; drainage area not measured. Sheet 2, Maine State map.

Penobscot Pond, Piscataquis County, T. 1, R. 11, and T. 1, R. 12; inlets, two small unnamed streams from the northwest and southwest; outlet, through Wadleigh and Rainbow ponds to Nahmakanta Lake (outlet to Pemadumcook Lake on West Branch of Penobscot River); length (approximate), 1½ miles; maximum width, about one-half mile; approximate area of water surface, 0.62 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Penobscot River, formed at Medway, Penobscot County, by union of East and West Branches; the West Branch, which may be considered the continuation of the main stream, is formed by the union of the North and South Branches in T. 2, R. 4, Somerset county, flows in a general northeasterly direction to the head of Chesuncook Lake, then takes a general southeasterly course to its junction with the East Branch; the length of the West Branch above the junction is about 100 miles, and in this distance it traverses Seeboomook, Chesuncook, and Pemadumcook lakes and receives the waters of numerous smaller lakes and streams; below Medway the course of the river is southward to Penobscot Bay; principal tributaries, Kenduskeag, Pushaw, Piscataquis, Passadumkeag, and East Branch of Penobscot River, besides the overflow of almost 500 lakes, most of which are small; length (approximate), about 200 miles; total fall, from source to mouth, about 2,000 feet; drainage area, above its mouth to Sandy Point, about 8,785 square miles. Gaging stations at Millinocket, West Enfield, and Sunkhaze Rip. Orland, Orono, Bucksport, Bangor, and Penobscot Bay sheets, U.S.G.S., and Maine State map (sheets 2, 3, 6, and 7).

Penobscot River, East Branch; see *East Branch of Penobscot River.*

Penobscot River, North Branch; see *North Branch of Penobscot River.*

Penobscot River, South Branch; see *South Branch of Penobscot River.*

Perry Pond, Penobscot County, T. 5, R. 7 W. E. L. S.; inlets, two short streams from west, one from north; outlet, by short stream into Seboeis River (tributary East Branch of Penobscot River); area of water surface, 0.59 square mile; drainage area not measured.

Phillips Lake, Hancock County, west-central Dedham Township; inlets, overflow from Mitchell, Moulton, Hurd, Mud, and Second ponds, and several small unnamed streams; two outlets; the greater part of the water flows from the north end of the lake northward as far as East Holden, thence southward through Long Pond, which has outlet through Moosehorn Creek to Dead River, which flows into Orland River, which is tributary to Penobscot River; the length of this outlet is 18 miles; the outlet at the southeast end of the lake carries water during medium and high stages into Green Lake, which discharges thence into Union River; elevation, 223 feet; dimensions of lake, about 1 mile wide by 1½ miles long; area of water surface of lake, 1.41 square miles; drainage area, 11.5 square miles. Gaging stations in Holden and Dedham. See pages 99 and 145 of this report. Orland sheet, U.S.G.S.

Phillips Lake outlet (northern), Hancock County, in northwestern Dedham Township; rises in Phillips Lake, at an elevation of 223 feet; flows from a point about 1 mile south of East Holden northwestward through Dedham Township, along the county line between Hancock and Penobscot counties, crossing into Holden Township, then makes a very abrupt bend and flows southwesterly nearly parallel to the Penobscot-Hancock County line, recrossing it and passing through the extreme western portion of Dedham Township into Bucksport Township, and entering Long Pond (outlet through Moosehorn Creek to Dead River, which is tributary to Orland River, which flows into the Penobscot); from Phillips Lake to the point where it enters Long Pond, the stream measures about 6 miles, and along this distance receives the flow of George, Hanson, and Saulter Ponds and several unnamed streams; total fall between the points above mentioned, about 157 feet; for drainage area, see Phillips Lake, pages 99 and 145 of this report. Gaging station at Dedham. Orland sheet, U.S.G.S.

Picked Mountain Pond, on the Penobscot-Aroostook County line between T. 6, R. 6, and Moro Township; inlet, a small unnamed stream; outlet, through Rockabema Lake to West Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); length (approximate), 1 mile; maximum width, one-half mile; area of water surface, 0.21 square mile; drainage area not measured. Sheet 6, Maine State map.

Pickerel Lake, Penobscot County, Lowell; outlet, by Eskatassis Stream into Passadumkeag River (tributary to Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Pickerel Lake, Washington County, northern Topsfield Township; outlet to Baskahegan Lake (outlet through Baskahegan Stream to Mattawamkeag River, which flows into Penobscot River); length (approximate), one-half mile; maximum width, one-half mile; drainage area not measured. Sheet 6, Maine State map.

Pickerel Pond, Penobscot County, Alton; inlet, short stream from south; outlet, by Ten Mile Brook to Birch Stream (tributary to Penobscot River); area of water surface, 0.10 square mile; drainage area not measured.

Pine Pond, Piscataquis County, T. 3, R. 13; inlet, a small unnamed stream from the west; outlet, Pine Stream to West Branch of Penobscot River; length (approximate), less than 1 mile; maximum width, about two-thirds mile; area of water surface, 0.22 square mile; drainage area not measured. Sheet 2, Maine State map.

Pine Stream, Piscataquis County; rises in Pine Pond in T. 3, R. 13; flows northward to its junction with West Branch of Penobscot River; receives the flow of Round and Little Pine ponds, besides that of perhaps nine other small unnamed streams; length (approximate), 12 miles; drainage area not measured. Sheet 2, Maine State map.

Piper Pond, Piscataquis County, western Abbot Township; inlet, a short stream from the north; outlet, through Thorn Brook to South Branch of Piscataquis River (tributary to Piscataquis River, which flows into Penobscot River); length (approximate), 2½ miles; maximum width, 1¼ miles; approximate area of water surface, 0.79 square miles; dam feasible; drainage area not measured. Sheets 3 and 7, Maine State map.

Piscataquis River, Piscataquis County; rises in Little Squaw Township; flows southeastward for about 25 miles, then turns and flows somewhat east of north to its junction with Penobscot River in Howland Township, Penobscot County; tributaries, Marble Brook, South Branch of the Piscataquis, Mill Stream, Black Stream, Alder Brook, Alder Stream, Sebec River, Pleasant River, Schoodic Stream, and Seboeis Stream, and the overflow of Greenleaf, Garland, Dow, and Adams Farm ponds; length (approximate), 65 miles; drainage area, at mouth, 1,500 square miles. Gaging station near Foxcroft. See pages 80, 143, 161, and 181 of this report. Sheets 2, 3, 6, and 7, Maine State map.

Pistol Ponds; see *Hot Pistol Pond, Side Pistol Pond, Second Pistol Pond,* and *Third Pistol Pond.*

Pleasant Lake, Aroostook County, Island Falls Township and T. 4, R. 3; outlet to East Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); length (approximate), 4 miles; maximum width, about 1 mile; approximate area of water surface, 2.20 square miles; present storage, 4 feet; additional available storage, 8½ feet; drainage area not measured. Sheet 6, Maine State map.

Pleasant Pond, Penobscot County, T. 6, R. 6; outlet, through Rockabema Lake to West Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); length (approximate), 2 miles; maximum width, one-half mile; area of water surface, 0.28 square mile; drainage area not measured. Sheet 6, Maine State map.

Pleasant Pond, Penobscot County, southwestern Garland Township; inlets, a short unnamed stream from the north and Kenduskeag River, which flows through the pond to Penobscot River in Bangor Township; length (approximate), one-fourth mile; maximum width, one-eighth mile; area of water surface, 0.11 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Pleasant Pond, Piscataquis County, Orneville; inlet, short stream from north; outlet, by Dead Stream into Pushaw Stream (tributary to Penobscot River); area of water surface, 0.14 square mile; drainage area not measured.

Pleasant River, Piscataquis County; formed by the junction of its East and West branches in T. 5, R. 8; flows generally southeastward to Piscataquis River (tributary to Penobscot River) in Milo Township; no tributaries below junction of East and West branches; length (approximate), 11 miles; drainage area, at mouth, 263 square miles. Sheets 2, 3, and 7, Maine State map.

Plunket Pond, Aroostook County, on boundary between Silver Ridge and Benedicta townships; inlet, a short stream from the northwest; outlet, through Molunkus Stream to Mattawamkeag River (tributary to Penobscot River); length (approximate), 1¼ miles; maximum width, one-third mile; area of water surface, 0.62 square mile; drainage area not measured. Sheet 6, Maine State map.

Poland Pond, Piscataquis County, T. 7, R. 14; inlets, from an unnamed pond on the north and an unnamed stream from the west; outlet, an unnamed stream about 2 miles long on the south to Round Pond (outlet by way of Caucomgomuc Lake to Chesuncook Lake on West Branch of Penobscot River); length (approximate), 1¼ miles; maximum width, one-half mile; area of water surface, 0.46 square mile; drainage area not measured. Sheet 2, Maine State map.

Pollard Brook, Penobscot County; rises in extreme northeastern Lagrange Township; flows southeastward to Penobscot River; receives the flow of a short unnamed stream from the northeast; length (approximate), 9 miles; drainage area not measured. Sheets 6 and 7, Maine State map.

Pollywog Pond, Piscataquis County, Ts. 1 and 2, R. 11 and T. 1, R. 12 inlets, Pollywog Stream, Farrar Brook, and overflow of Wadleigh Pond; outlet, through Nahmakanta Stream to Nahmakanta Lake (outlet to Pemadumcook Lake on West Branch of Penobscot River); length (approximate), 1¼ miles; maximum width, about one-half mile; area of water surface, 0.70 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Porter Pond, Penobscot County, T. 3 ND.; outlet, through Nicatous Lake to Nicatous Stream (tributary to Passadumkeag River, which flows into Penobscot River); length (approximate), three-fourths mile; maximum width, one-eighth mile; approximate area of water surface, 0.15 square mile; drainage area not measured. Sheet 7, Maine State map.

Poverty Pond, Piscataquis County, southwestern Willimantic Township; outlet to Davis Stream (tributary to Wilson Stream, which flows through Sebec Lake to Sebec Stream, which joins the Piscataquis, a tributary of the Penobscot); length (approximate), one-third mile; maximum width, about one-fourth mile; area of water surface, 0.05 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Pratt Brook, Piscataquis County; rises in Henderson Pond in T. 1, R. 11; flows westward through an unnamed pond in T. 1, R. 10, to Middle Joe Mary Lake (outlet through Lower Joe Mary Lake to Pemadumcook Lake on West Branch of Penobscot River); receives the flow of Cooper Brook from the southwest; length (approximate), 7 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Pudding Pond, Piscataquis County, T. 7, R. 8 N. W. P.; outlet, by short stream into Bear Brook, thence to Sebec Lake and Sebec River (tributary to Piscataquis

River, which flows into Penobscot River); area of water surface, 0.05 square mile; drainage area not measured.

Pug Pond, Penobscot County, Alton; outlet, by Pug Brook into Pushaw Stream (tributary to Penobscot River); area of water surface, 0.10 square mile; drainage area not measured.

Pushaw Lake, Penobscot County, Hudson, Glenburn, Oldtown, and Orono townships; elevation, 117 feet; inlets, three short unnamed streams from the west and Pushaw Stream from the north, which flows through the pond to Stillwater River, the west channel of the Penobscot near Oldtown; length (approximate), 8 miles; maximum width, 2½ miles; approximate area of water surface, 7.25 square miles; available storage, 3 to 5 feet; drainage area at outlet of lake, 125 square miles. See also Little Pushaw Pond. Bangor and Orono sheets, U.S.G.S., and sheets 3 and 7, Maine State map.

Pushaw Stream, Penobscot County; rises in northern Charleston Township; flows southeastward through Little Pushaw and Pushaw ponds to Stillwater River, the west channel of Penobscot River at Marsh Island; receives the flow of Mohawk Brook and Dead Stream, besides the overflow of Little Pushaw, Pushaw, and Mud ponds; length (approximate), 24 miles; drainage area at mouth, 263 square miles. Sheets 3 and 7, Maine State map.

Quaker Brook, Piscataquis County; rises in T. 4, R. 13; flows southeastward to Chesuncook Lake on West Branch of Penobscot River; receives the flow of two small unnamed streams from the southwest; length (approximate), 3½ miles; drainage area not measured. Sheet 2, Maine State map.

Quakish Lake, Penobscot County, central Purchase 4 Township; inlet, overflow from Elbow Lake; outlet, through Shad Pond to West Branch of Penobscot River (to Penobscot River); a canal constructed about 1909 leads most of the flow to Millinocket Stream, and thence to Shad Pond; when this canal is in operation the natural outlet of Quakish Lake is almost dry; length (approximate), about 2 miles; maximum width, less than 1 mile; approximate area of water surface, 1.70 square miles; drainage area, including all of West Branch down to dam at outlet of Quakish Lake, 1,880 square miles. Sheet 6, Maine State map.

Ragged Lake, Piscataquis County, Tps. 2 and 3, R. 13; inlet, a short stream less than one-half mile long from the north; outlet, Ragged Stream to Caribou Lake (outlet to Chesuncook Lake on West Branch of Penobscot River); length (approximate), 4½ miles; maximum width, 1½ miles; approximate area of water surface, 3.24 square miles; drainage area not measured. Sheet 2, Maine State map.

Ragged Stream, Piscataquis County; rises in Ragged Lake (see above); flows westward and northward to Caribou Lake (outlet to Chesuncook Lake on West Branch of Penobscot River); principal tributaries, Ragged Stream, Bear Brook, and overflow from Blackberry Pond; length (approximate), 6 miles; drainage area not measured. Sheet 2, Maine State map.

Ragmuff Stream, Piscataquis County; rises in T. 4, R. 15; flows westward to its junction with West Branch of Penobscot River; receives the flow of two unnamed streams from the north, about 2½ and 3 miles long, respectively; length (approximate), 5 miles; drainage area not measured. Sheet 2, Maine State map.

Rainbow Lake, Piscataquis County, T. 2, R. 11; inlets, four small unnamed streams; outlet, an unnamed stream about 4 miles long entering Nahmakanta Lake (outlet to Pemadumcook Lake on West Branch of Penobscot River); length (approximate), a little more than 3 miles; maximum width, about three-fourths mile; approximate area of water surface, 2.30 square miles; present storage, 4 to 6 feet; drainage area not measured. Sheets 2 and 6, Maine State map.

Rainbow Stream, Piscataquis County, T. 2, R. 12; flows southeastward to Rainbow Pond (outlet to Nahmakanta Lake, which has outlet to Pemadumcook Lake on West Branch of Penobscot River); receives the flow of one small tributary from the northwest; length, about 4 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Rat Pond, Piscataquis County, T. 2, R. 9; outlet Grant Brook to Millinocket Lake (outlet to Shad Pond on West Branch of Penobscot River); length (approximate), one-half mile; maximum width, about one-half mile; area of water surface, 0.09 square mile; drainage area not measured. Sheet 6, Maine State map.

Red Brook, Piscataquis County; rises in T. 5, R. 12; flows southwestward to Chesuncook Lake on West Branch of Penobscot River; receives the flow of perhaps four unnamed streams; length (approximate), 6 miles; drainage area not measured. Sheet 2, Maine State map.

Reeds Brook, Penobscot County; rises in southwestern Hampden Township, at an elevation of 200 feet; flows northwestward and westward into Penobscot River; receives the flow of two small unnamed streams; length (approximate), 2½ miles; total fall, 180 feet; drainage area not measured. Bucksport sheet, U.S.G.S.

Ripogenus Lake, Piscataquis County, T. 3, Rs. 11 and 12; inlets, Ripogenus Stream and overflow from Frost Pond and West Branch of Penobscot River, length (approximate), about 2½ miles; maximum width, one-half mile; approximate area of water surface, 1.27 square miles; present storage, 10 feet; additional available storage, 40 feet; drainage area, including outlet, 1,410 square miles. Sheets 2 and 6, Maine State map.

Ripogenus Stream, Piscataquis County; rises in Harrington Lake in T. 4, R. 11; flows southwestward and then southeastward to Ripogenus Lake on West Branch of Penobscot River; receives the flow of a number of unnamed streams from the west; length (approximate), about 6 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

River Pond, Piscataquis County, T. 2, R. 9; inlet, from Compass and Katahdin ponds; outlet, to West Branch of Penobscot River; length (approximate), one-third mile; maximum width, about one-fifth mile; area of water surface, 0.22 square mile; drainage area not measured. Sheet 2, Maine State map.

Roaring Brook Pond, Piscataquis County, T. 7, R. 9 N. W. P.; outlet, by Roaring Brook into Pleasant River and Piscataquis River (tributary to Penobscot River); area of water surface, 0.19 square mile; drainage area not measured.

Roberts Brook, Somerset County; rises in a small pond in T. 5, R. 20; flows southeastward to Dole Pond (outlet to North Branch of Penobscot River, which flows into West Branch of Penobscot River); length, about 4 miles; drainage area not measured. Sheet 2, Maine State map.

Roberts Pond, Somerset County, T. 5, R. 20 W. E. L. S.; inlet, short stream from north; outlet, by Roberts Brook to Dole Brook into North Branch of Penobscot River (tributary to West Branch of Penobscot River); area of water surface, 0.07 square mile; drainage area not measured.

Rocky Pond, Piscataquis County, just south of boundary between T. 3, R. 11, and T. 2, R. 11; inlet, a short unnamed stream from the west; outlet, an unnamed stream about 2½ miles long flowing to West Branch of Penobscot River; length (approximate), one-half mile; maximum width, less than one-fourth mile; area of water surface, 0.10 square mile; drainage area not measured. Sheet 2, Maine State map.

Rockabema Lake, Aroostook County, Moro Township; inlets, overflow of Pleasant and Picked Mountain ponds from the west; outlet, to West Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into the Penobscot); length (approximate), 1¼ miles; maximum width, about five-eighths mile; approximate area of water surface, 0.64 square mile; present storage, 5 feet; several feet additional storage available; drainage area not measured. Sheet 6, Maine State map.

Rocky Pond, Piscataquis County, T. 3, R. 10 W. E. L. S.; outlet, by short brook into Sourdnahunk Stream (tributary to West Branch of Penobscot River); area of water surface, 0.03 square mile; drainage area not measured.

Rocky Pond, Piscataquis County, T. A, R. 11; inlets, two short unnamed streams from the north; outlet, to Crawford Pond (outlet to Cooper and Pratt brooks, which flow through Middle and Lower Joe Mary lakes to Pemadumcook Lake on West Branch of Penobscot River); length (approximate), seven-eighths mile; maximum width, about one-third mile; area of water surface, 0.28 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Ross Pond, Piscataquis County, T. 7, R. 15; outlet, a short stream about three-fourths mile long flowing from the southeast into Caucomgomuc Lake (outlet to Chesuncook Lake on West Branch of Penobscot River); length (approximate), 1½ miles; maximum width, about one-half mile; area of water surface, 0.52 square mile; drainage area not measured. Sheet 2, Maine State map.

Round Pond, Piscataquis County, on boundary between T. 3, R. 13, and T. 3, R. 14; outlet, a small stream about one-half mile long flowing into West Branch of Penobscot River; length (approximate), one-half mile; maximum width, about one-third mile; area of water surface, 0.18 square mile; drainage area not measured. Sheet 2, Maine State map.

Round Pond, Piscataquis County, T. 6, R. 11; inlets, from Chamberlain Lake and one short unnamed stream from the west; outlet, to Telos Lake (outlet to Webster Brook, which flows through Grand Lakes to East Branch of Penobscot River; length (approximate), 1 mile; maximum width, 1 mile; approximate area of water surface, including Telos Lake, 3.85 square miles; present storage, 10 feet; additional storage available, 15 to 20 feet; drainage area not measured. Sheets 2 and 6, Maine State map.

Round Pond, Piscataquis County, T. 7, R. 14; inlets, overflow from Poland and Daggett ponds; outlet, Ciss Stream to Caucomgomuc Lake (outlet to Chesuncook Lake on West Branch of Penobscot River; length (approximate), 1 mile; maximum width, about three-fourths mile; area of water surface, 0.71 square mile; drainage area not measured. Sheet 2, Maine State map.

Round Pond, Waldo County, southwestern Monroe Township; outlet, into North Branch of Marsh River (tributary to Marsh River, which flows to Penobscot River); length (approximate), one-fourth mile; maximum width, about one-fourth mile; drainage area not measured. Sheets Nos. 3 and 7, Maine State map.

Rum Pond, Piscataquis County, T. 8, R. 10; inlet, a short unnamed stream from the north; outlet to Wilson Pond (outlet, Wilson Stream to Sebec Lake and Sebec River, which flows into Piscataquis River, a branch of the Penobscot); length (approximate), 1½ miles; maximum width, 1 mile; area of water surface, 0.20 square mile; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Russell Brook, Piscataquis County; rises in southern part of T. 5, R. 15; flows southeastward to Russell Pond (outlet to West Branch of Penobscot River); one tributary—an unnamed stream about 1 mile long from the west in the extreme upper part of its course; length, about 4½ miles; drainage area not measured. Sheet 2, Maine State map.

Russell Pond, Piscataquis County, T. 4, R. 15; inlets, Russell Brook from the north, an unnamed stream about 4½ miles long from the east, and Russell Stream from the west, which flows through the pond to West Branch of Penobscot River; length (approximate), 2 miles; maximum width, a little less than 1 mile; area of water surface, 0.89 square mile; drainage area not measured. Sheet 2, Maine State map.

Russell Pond, Somerset County, T. 5, R. 16; inlets, two small unnamed streams from the north and northeast; outlet, Russell Stream, from its southern end to West Branch of Penobscot River (to Penobscot River); length (approximate), about 1 mile; maximum width, about one-third mile; area of water surface, 0.26 square mile; drainage area not measured. Sheet 2, Maine State map.

Russell Stream, Somerset County; rises in Russell Pond in west-central T. 5, R. 16; flows southeastward through Russell Pond in T. 4, R. 15, Piscataquis County, and thence southward to West Branch Penobscot River; receives the flow of four unnamed streams from the east, ranging from 2 to 6 miles in length, and one small unnamed stream from the west about 1 mile below Russell Pond (T. 5, R. 16); length, about 18 miles; drainage area not measured. Sheet 2, Maine State map.

Salmon Brook, Piscataquis County; rises in an unnamed pond in central Guilford Township; flows almost directly south through a small unnamed pond to Piscataquis River (tributary to Penobscot River); receives the flow of a small unnamed stream from the west; length (approximate), 4 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Salmon Brook, Piscataquis County; rises in an unnamed pond in Barnard Township; flows southward to Piscataquis River (tributary to Penobscot River); no tributaries; length (approximate), 2¾ miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Salmon Stream, Penobscot County; rises in Salmon Stream Ponds in T. 1, R. 6; flows southward to Penobscot River; receives the overflow of Davidson and Burnt ponds, besides that of many small unnamed streams; length (approximate), 11 miles; drainage area not measured. Sheet 6, Maine State map.

Salmon Stream Pond, Piscataquis County, Guilford; outlet, by Salmon Stream into Piscataquis River (tributary to Penobscot River); area of water surface, 0.18 square mile; drainage area not measured.

Salmon Stream Ponds (3 connected), Penobscot County, T. 1, R. 6; inlets, a number of small unnamed streams; outlet, through Salmon Stream to Penobscot River; length (approximate) of largest pond, 2 miles; maximum width, two-thirds mile; approximate area of water surface, upper pond, 0.12 square mile; middle pond, 0.86 square mile; lower pond, 0.17 square mile; drainage area not measured. Sheet 6, Maine State map.

Sam Ayers Stream, Penobscot County; rises in T. 2, R. 9; flows southward and southwestward to Mattamiscontis Stream (tributary to Penobscot River); receives the flow of about four short unnamed streams; length (approximate), 12 miles; drainage area not measured. Sheets 6 and 7, Maine State map.

Sandy Brook, Piscataquis County; rises in T. 4, R. 11; flows southwestward and southward to Harrington Lake (outlet to Ripogenus Lake on West Branch of Penobscot River); receives the flow of two unnamed streams from the east; length (approximate), 3½ miles; drainage area not measured. Sheet 2, Maine State map.

Sandy Stream, Piscataquis County; rises in T. 3, R. 9; flows southeastward to Millinocket Lake (outlet to Shad Pond on West Branch of Penobscot River); receives the flow of Togue Stream and an unnamed stream about 4½ miles long from the west; length (approximate), 9½ miles; drainage area not measured. Sheet 6, Maine State map.

Saponic Pond, Penobscot County, Burlington Township and T. 2, N. D.; inlet, from a small unnamed pond to the south and Passadumkeag River, which flows through the pond to Penobscot River; length (approximate), 1½ miles; maximum width, 1¾ miles; approximate area of water surface, 1.05 square miles; drainage area not measured. Sheet 7, Maine State map.

Saulter Pond, Hancock County, near the western boundary line of Dedham Township; outlet, to Hanson Pond (outlet through Phillips Lake outlet (northern) to Long Pond, which has outlet through Moosehorn Creek to Dead River, a tributary of Orland River, which flows into Penobscot River); elevation, 253 feet; between point of outlet and entrance to Hanson Pond, a distance of about three-eighths mile, there is a fall of approximately 13 feet; length, about three-eighths mile; width (approximate), one-eighth mile; area of water surface, 0.02 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Sawtelle Brook, Penobscot County; rises in T. 7, R. 8; flows southeastward into Seboeis River (tributary to East Branch of Penobscot River); receives the overflow of

Scraggley, Mud, and Hay ponds and Hay Lake, besides a number of small unnamed streams from the east; length (approximate), 12 miles; drainage area not measured. Sheet 6, Maine State map.

Schoodic Lake, Piscataquis County, T. 4, R. 8, and Medford Townships; outlet, through Schoodic Stream to Piscataquis River (tributary to Penobscot River); length (approximate), 8½ miles; maximum width, 2¾ miles; approximate area of water surface, 10.92 square miles; present storage, 4 feet; additional available storage, 3 feet; drainage area not measured. Sheets 6 and 7, Maine State map.

Schoodic Stream, Penobscot County; rises in T. 1, R. 7; flows slightly southeastward, joining an unnamed stream, the outlet of Jerry Pond, which flows into West Branch of Penobscot River through the pond (about 1½ miles in extent) formed by the dam about 1¼ miles below the outlet of Shad Pond; receives the flow of one small unnamed stream from the northeast; length (approximate), 4¼ miles; drainage area not measured. Sheet 6, Maine State map.

Schoodic Stream, Piscataquis County; rises in Schoodic Lake in southern Medford Township; flows southeastward to Piscataquis River (tributary to Penobscot River); receives the flow of two short unnamed streams from the northeast; length (approximate), 3½ miles; drainage area at mouth, 58 square miles. Sheets 6 and 7, Maine State map.

Scott Brook, Piscataquis County; rises in T. 5, R. 15; flows northward to its junction with Loon Stream (tributary to Caucomgomuc Lake, which has outlet to Chesuncook Lake on West Branch of Penobscot River); in the upper part of its course it receives the flow of two unnamed streams from the east and west, respectively; length (approximate), 6 miles; drainage area not measured. Sheet 2, Maine State map.

Scraggly Lake, Penobscot County, T. 7, R. 8; outlet, through Sawtelle Brook to Seboeis River (tributary to East Branch of Penobscot River); length (approximate), 1½ miles; maximum width, three-fourths mile; approximate area of water surface, 1.96 square miles; drainage area not measured. Sheet 6, Maine State map.

Scraggrook Brook, Aroostook County; rises in southern Amity Township; flows southward, then northwestward to Mattawamkeag River (tributary to Penobscot River); receives the flow of a number of short unnamed streams; length (approximate), 9 miles; drainage area not measured. Sheet 6, Maine State map.

Sebec Lake, Piscataquis County, Willimantic, Bowerbank, Foxcroft, and Sebec townships; inlets, Wilson and Long Pond streams, besides about four short unnamed streams ranging in length from 2½ to 8 miles; outlet, Sebec River to Piscataquis River (tributary to Penobscot River); length (approximate), 11 miles; maximum width, 3 miles; approximate area of water surface, 10.93 square miles; present storage, 8 feet; additional available storage, 9 feet; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Sebec River, Piscataquis County; rises in Sebec Lake; flows eastward and southeastward to Piscataquis River (tributary to Penobscot River); receives the flow of Salmon Brook, besides that of two unnamed streams from the north, each about 6 miles long; length (approximate), 10 miles; drainage area at mouth, 393 square miles. Sheets 2, 3, and 7, Maine State map.

Seboeis Lake, Penobscot County, T. 8, R. 7; inlets, Wadleigh and Boody brooks and overflow of Jones Pond, besides the flow of several unnamed streams; outlet, through the Grand Lakes and Seboeis River to East Branch of Penobscot River; length (approximate), 1 mile; maximum width, 1⅓ miles; approximate area of water surface, 2.30 square miles; present storage, 5 to 6 feet; drainage area not measured. Sheet 6, Maine State map.

Seboeis Lake, Piscataquis County, T. 4, Rs. 8 and 9; inlets, the overflow of Tutie Pond, besides that of two short unnamed streams from the north; outlet, Seboeis Stream and Endless Lake to Piscataquis River (tributary to Penobscot River); length (approximate), 6 miles; maximum width, 1½ miles; approximate area of water surface, 6.40 square miles; present storage, 8 feet; additional available storage, 5 feet; drainage area at outlet, 49 square miles. Sheets 6 and 7, Maine State map.

Seboeis River, Penobscot County; rises in Seboeis Lake in T. 8, R. 7; flows southward to its junction with East Branch of Penobscot River; principal tributaries, Sawtelle and Nutupsemic brooks and overflow of Grand Lakes and Shin ponds; length (approximate), 28 miles; drainage area not measured. Sheet 6, Maine State map.

Seboeis Stream, Piscataquis County; rises in Seboeis Lake, T. 4, Rs. 8 and 9; flows southeastward through Endless Lake into Piscataquis River (tributary to Penobscot River); tributaries, East Branch of Seboeis Stream and about four short unnamed streams; length (approximate), 18 miles; drainage area at mouth, 150 square miles. Sheets 6 and 7, Maine State map.

Seboomook Lake, Somerset County, Plymouth and Seboomook Townships; inlets, Logan Brook, Nulhedus Brook, Niger Stream, Elm Stream, and West Branch of Penobscot River, which flows through it; length (approximate), 7 miles; maximum width, 1¼ miles; area of water surface, 8.52 square miles; drainage area not measured. Sheet 2, Maine State map.

Second Grand Lake, Piscataquis County, T. 6, R. 9; inlets, Bailey, Webster, Boody, and Hay brooks and the overflow from Third, Frost, and Mud ponds, besides several small unnamed streams; outlet, through Grand Lake to East Branch of Penobscot River; length (approximate), 4 miles; maximum width, about 1¼ miles; approximate area of water surface, including Grand Lake, 6.63 square miles; present storage, 14 feet; additional available storage, 10 feet; drainage area not measured. Sheets 2 and 6, Maine State map.

Second Houston Ponds, Piscataquis County, T. 7, R. 9 N. W. P.; inlets, short stream from west and one from north; outlet, by short stream into Big Houston Pond, thence through Houston Stream and Pleasant River to Piscataquis River (tributary to Penobscot River); area of water surface, 0.28 square mile; drainage area not measured.

Second Pistol Pond, Penobscot County, on boundary between Tps. 3 N. D. and 4 N. D.; inlets, from Third Pistol and Side Pistol ponds; outlet, through Hot Pistol Pond to Passadumkeag River (tributary to Penobscot River); length (approximate), 1 mile; maximum width, one-fourth mile; area of water surface, 0.42 square mile; drainage area not measured. Sheet 7, Maine State map.

Second Pond, Hancock County, Dedham Township; inlet, from Mud Pond; outlet, to Phillips Lake (outlet to Long Pond, which has outlet through Moosehorn Creek to Dead River, a tributary of Orland River, which flows into Penobscot River); elevation, 375 feet; between the point of outlet of Second Pond and where it enters Phillips Lake, a distance of about 1 mile, there is a fall of approximately 152 feet; length, about one-half mile; maximum width, less than one-fourth mile; area of water surface, 0.08 square mile; drainage area not measured. Orland sheet, U.S.G.S.

Second Pond, Piscataquis County, T. 7, R. 14; inlet, Ellis Stream, which flows through First and Second ponds to Chamberlain Lake (outlet through Round Pond and Telos Lake to Webster Brook, which flows through Grand Lake to East Branch of Penobscot River); length (approximate), three-fourths mile; maximum width, one-half mile; area of water surface, 0.32 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Sedgeunkedunk Stream, Penobscot County; rises in Fields Pond in eastern Orrington Township, at an elevation of 105 feet; flows northwestward, then southwestward, then again slightly northwestward to its junction with Penobscot River; tributaries, two short unnamed streams; length (approximate), 5 miles; total fall, 100 feet; drainage area not measured. Bangor, Bucksport, and Orland sheets, U.S.G.S.

Shad Pond, Penobscot County, Purchase 4 and T. A., R. 7, on West Branch Penobscot; inlets, the natural outlet of Quakish Lake, Millinocket Stream, and overflow of Nollesemic Lake; outlet, West Branch of Penobscot River; length (approximate), less than 3 miles; maximum width, less than one-half mile; approximate area of water surface, 0.36 square mile; drainage area not measured. Sheet 6, Maine State map.

Shallow Lake, Piscataquis County, T. 7, R. 14; inlet, from Shirley Pond; outlet, to Daggett Pond (outlet to Caucogomuc Lake, which has outlet to Chesuncook Lake on West Branch Penobscot River); length (approximate), 1½ miles; maximum width, two-thirds mile; approximate area of water surface, 1.72 square miles; present storage, 6 feet; drainage area not measured. Sheet 2, Maine State map.

Shin Ponds (three connected), Penobscot County, T. 6, R. 6, T. 5, R. 7, and Mount Chase; inlets, a number of small unnamed streams; outlet to Seboeis River (tributary to East Branch Penobscot River); length of largest pond (approximate), 1¾ miles; maximum width, 1 mile; area of water surface, 1.56 square miles; drainage area not measured. Sheet 6, Maine State map.

Shirley Bog, Piscataquis County, Shirley; inlet, stream from the north; outlet, by Bog Stream into Bald Mountain Stream and North Branch Piscataquis River (tributary to Penobscot River); area of water surface, 2 square miles; drainage area not measured.

Shirley Pond, Piscataquis County, T. 7, R. 14; outlet to Shallow Lake (outlet to Caucogomuc Lake, which has outlet to Chesuncook Lake on West Branch Penobscot River); length (approximate), 1 mile; maximum width, about one-half mile; approximate area of water surface, 0.52 square mile; drainage area not measured. Sheet 2, Maine State map.

Side Pistol Pond, Penobscot County, on boundary between Tps. 3 and 4 N. D.; outlet, through Second Pistol Pond to Hot Pistol Pond (outlet to Passadumkeag River, which flows into Penobscot River); length (approximate), five-eighths mile; maximum width, one-half mile; area of water surface included in Second Pistol Pond; drainage area not measured. Sheet 7, Maine State map.

Silver Lake, Hancock County, southern Bucksport Township; inlets, one small unnamed brook and Mill Stream, which flows through Silver Lake to Penobscot River; elevation, 114 feet; length, about three-fourths mile; maximum width, less than one-fourth mile; area of water surface, 0.08 square mile; drainage area not measured. Bucksport sheet, U.S.G.S.

Silver Lake, Piscataquis County, T. 6, R. 9; inlets, White Brook from the north and West Branch of Pleasant River, which flows through the pond to Piscataquis River (tributary to Penobscot River); length (approximate), seven-eighths mile; maximum width, three-fourths mile; approximate area of water surface, 0.70 square mile; present storage, 6 feet; additional available storage, 8 feet; drainage area at outlet, 104 square miles. Sheets 2, 3, 6, and 7, Maine State map.

Sink Pond, Piscataquis County, T. 7, R. 11; outlet, to Third Lake, which has outlet to Grand Lakes on East Branch of Penobscot River; length (approximate), two-thirds mile; maximum width, about one-half mile; area of water surface, 0.10 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Skiticook Lake, Aroostook County, on boundary between Oakfield Township and T. 4, R. 3; inlets, the overflow of Mud Pond and one short unnamed stream; outlet, to East Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); length (approximate), 1½ miles; maximum width, two-thirds mile; approximate area of water surface, 1.04 square miles; drainage area not measured. Sheet 6, Maine State map.

Slaughter Pond, Piscataquis County, T. 3, R. 11; outlet, an unnamed stream about 3 miles long to Sourdnahunk Stream (tributary to West Branch of Penobscot River); length (approximate), one-third mile; maximum width, about one-fourth mile; drainage area not measured. Sheet 2, Maine State map.

Sly Brook, Aroostook County; rises in Caribou Lake, in Island Falls Township; flows northwestward and northeastward to West Branch of Mattawamkeag (tributary to

Mattawamkeag River, which flows into Penobscot River); no tributaries; length, about 5 miles; drainage area not measured. Sheet 6, Maine State map.

Sly Brook, Piscataquis County; rises in a small unnamed pond in T. 7, R. 11; flows eastward to its entrance into Third Lake (outlet through Grand Lakes to East Branch of Penobscot River); length, about 2½ miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Smith Brook, Aroostook County; rises in southern Glenwood Township; flows southeastward to Mattawamkeag River (tributary to Penobscot River); receives the flow of two short unnamed streams; length, about 9 miles; drainage area not measured. Sheet 6, Maine State map.

Smith Brook, Penobscot County; rises in an unnamed pond in Purchase 4 Town; flows northeastward to its junction with Millinocket Stream (tributary to Shad Pond on West Branch of Penobscot River); receives the flow of an unnamed stream from the south; length (approximate), 3½ miles; drainage area not measured. Sheet 6, Maine State map.

Smith Brook, Somerset County; rises in T. 5, R. 16; flows eastward and northward to its junction with Whitney Brook in T. 6, R. 15, Piscataquis County (tributary to Loon Lake, which has outlet by way of Caucomgomuc Lake to Chesuncook Lake on West Branch of Penobscot River); receives the two unnamed streams and the overflow of a small pond from the west; length (approximate), 6 miles; drainage area not measured. Sheet 2, Maine State map.

Snake Pond, Piscataquis County, T. 7, R. 11; outlet, through Third Lake to Grand Lakes on East Branch of Penobscot River; length (approximate), 1 mile; maximum width, less than one-half mile; approximate area of water surface, 0.38 square mile; present storage, 7 feet; drainage area not measured. Sheets 2 and 6, Maine State map.

Snowshoe Lake, Penobscot County, T. 7, R. 7; inlets, from Grand and Seboeis lakes; outlet, through Whitehouse Lake and Seboeis River to East Branch of Penobscot River; length (approximate), 1½ miles; maximum width, 1 mile; approximate area of water surface, 1.1 square miles; present storage, 5 to 6 feet; drainage area not measured. Sheet 6, Maine State map.

Snowshoe Pond, Penobscot County, Clifton; outlet, by short stream into Chemo Lake, Chemo Stream (tributary to Penobscot River); area of water surface, 0.01 square mile; drainage area not measured.

Soldier Brook, Penobscot County; rises in T. 3, R. 8; flows southeastward through Burnt Land Pond to East Branch of Penobscot River; receives the flow of three small unnamed streams; length (approximate), 8½ miles; drainage area not measured. Sheet 6, Maine State map.

Soper Brook, Piscataquis County; rises in T. 5, R. 11; flows southwestward and southward to its entrance into Harrington Lake (outlet to Ripogenus Lake on West Branch of Penobscot River); receives the flow of 10 or 11 unnamed streams in approximately 7 miles; drainage area not measured. Sheet 2, Maine State map.

Souadabscook Stream, Penobscot County; rises in Etna Pond in Stetson, Etna, and Carmel townships; flows slightly southeastward through Carmel, Hermon, and Hampden townships to its junction with Penobscot River; passes through Hermon and Hammond ponds; tributaries, Kingsley, West Branch of Souadabscook, Wheeler, and several unnamed streams and stream from George Pond; length, about 18 miles; drainage area at mouth, 203 square miles. See Kenduskeag Stream. Sheets Nos. 3 and 7, Maine State map.

Sourdnahunk Lake, Piscataquis County, T. 5, Rs. 10 and 11, and T. 4, R. 10; inlets, four small unnamed streams; outlet, Sourdnahunk Stream to West Branch of Penobscot River; length (approximate), 3 miles; maximum width, about three-fourths mile; approximate area of water surface, 3.84 square miles; available storage, 4 feet; drainage area not measured. Sheet 2, Maine State map.

Sourdnahunk Stream, Piscataquis County; rises in Sourdnahunk Lake in T. 4, R. 10; flows southeastward to its junction with West Branch of Penobscot River; receives the flow of about nine unnamed streams and the overflow from Slaughter, Rocky, Kidney, and Pitch ponds from the west; length (approximate), 14 miles; drainage area not measured. Sheet 2, Maine State map.

South Branch Lake, Penobscot County, on boundary between Tps. 2 and 3, R. 8; inlets, two short unnamed streams on the north; outlet, through Mattamiscontis Stream to Penobscot River; length (approximate), 3 miles; maximum width, about 1½ miles; area of water surface, 3.06 square miles; drainage area not measured. Sheets 6 and 7, Maine State map.

South Branch of Penobscot River, Somerset County; rises in Penobscot Lake in T. 4, R. 5, Dole, Hammond, and Prentiss townships; flows eastward for about 10 miles to its junction with the North Branch, in Pittston Township, where it forms the West Branch of the Penobscot; principal tributaries, Bald, Alder, and Lane brooks; drainage area above junction with the North Branch, 186 square miles. Sheet 2, Maine State map.

South Branch of Piscataquis River, Piscataquis County; rises in Kingsbury Pond, in southwestern Kingsbury Township; flows northeastward for about 9 miles, then turns and flows southeastward for 3 miles, then again northeastward to its junction with the Piscataquis River (tributary to the Penobscot); receives the flow of Thorn and Carleton brooks and many short unnamed streams; length (approximate), 15 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Spaulding Lake, Aroostook County, northern Oakfield Township; inlet, a small unnamed stream on the north; outlet, to East Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); length (approximate), 1 mile; maximum width, one-third mile; approximate area of water surface, 0.24 square miles; drainage area not measured. Sheet 6, Maine State map.

Spectacle Pond, Piscataquis County, southwestern Blanchard Township; outlet, through Thorn Brook to South Branch of Piscataquis River (tributary to Piscataquis River, which flows into Penobscot River); length (approximate), three-fourths mile; maximum width, three-fourths mile; area of water surface, 0.22 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Spectacle Pond, Piscataquis County, northwestern Monson Township; outlet, through Monson Pond to Davis Stream (tributary to Wilson Stream, which flows through Sebec Lake and Sebec River into the Piscataquis, which in turn flows into the Penobscot); length (approximate), 1½ miles; maximum width, a little less than one-half mile; area of water surface, 0.24 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

Spencer Pond, Penobscot County, T. 3 N. D.; outlet, through Duck Stream to Nicatous Lake (outlet through Nicatous Stream to Passadumkeag River, which flows into Penobscot River); length (approximate), one-half mile; maximum width, about one-fourth mile; area of water surface, 0.06 square mile; drainage area not measured. Sheet 7, Maine State map.

Spencer Pond, Somerset County, T. 4, R. 18 W. E. L. S.; inlets, two short streams from north; outlet, by stream about 4 miles long into North Branch of Penobscot River (tributary to West Branch of Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Spring Pond, Penobscot County, T. 3 N. D.; outlet, to Passadumkeag River (tributary to Penobscot River); length (approximate), 1 mile; maximum width, one-third mile; approximate area of water surface, 0.62 square mile; drainage area not measured. Sheet 7, Maine State map.

Spruce Pond, Somerset County, T. 2, R. 4 N. B. K. P.; inlet, short stream from north; outlet, by short stream into South Branch of Penobscot River (tributary to

West Branch of Penobscot River); area of water surface, 0.03 square mile; drainage area not measured.

Stillwater River. At Orson and Marsh islands, Penobscot County, the Penobscot flows in two channels, the channel to the east retaining the name of Penobscot River, that to the west being called Stillwater River; in the upper part of its course it receives the flow of Pushaw Stream; length (approximate), 7 miles; the total fall in this distance is about 25 feet; drainage area not measured. Orono sheet, U.S.G.S.

Sucker Pond, Piscataquis County, T. 6, R. 9 N. W. P.; outlet, by Sucker Brook into Pleasant River and Piscataquis River (tributary to Penobscot River); area of water surface, 0.16 square mile; drainage area not measured.

Sunkhaze Stream, Penobscot County; rises on boundary between Greenbush and Milford townships; flows southwestward and then northwestward to its junction with Penobscot River, in Milford Township; tributaries, North and South branches and several unnamed streams from 4 to 6 miles long: length (approximate), 8 miles; drainage area not measured. Sheet 7, Maine State map.

Sweets Pond, Penobscot County, south-central Orrington Township; inlets, three small unnamed streams; outlet, by Mill Stream to Penobscot River; elevation, 188 feet; length (approximate), 1 mile; maximum width, less than one-third mile; area of water surface, 0.20 square mile; drainage area not measured. Bucksport sheet, U.S.G.S.

Swift Brook, Penobscot County; rises in western Patten Township, flows southward to its junction with Mill Brook (tributary to East Branch of Penobscot River); tributaries, three small unnamed streams; length (approximate), 9 miles; drainage area not measured. Sheet 6, Maine State map.

Taylor Brook, Penobscot County; rises in southern Lakeville Township; flows slightly southwestward to Passadumkeag River (tributary to Penobscot River); receives the flow of an unnamed stream from the north about 3 miles long; length (approximate), 3½ miles; drainage area not measured. Sheet 7, Maine State map.

Tea Pond, Piscataquis County, T. 2, R. 9 W. E. L. S.; inlet, short stream from north; outlet, by short stream into Sandy Stream through Millinocket Lake and Millinocket Stream to West Branch of Penobscot River; area of water surface, 0.05 square mile; drainage area not measured.

Telos Brook, Piscataquis County; rises in T. 6, R. 12; flows southward, then northeastward to Telos Lake (outlet through Webster Brook to Grand Lake, which flows through East Branch of Penobscot River); receives the flow of three short unnamed streams; length (approximate), 5 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Telos canal; previous to 1845 a canal was cut from Telos Lake in the Allagash Basin to Webster Lake, and by means of a dam constructed between Chamberlain and Eagle lakes the water is rendered in part tributary to the Penobscot. Its general effect is to supply water to the Penobscot during the log-driving season, but after the gates at the dams are opened more water flows toward the St. John, as the gate sills are about 2 feet lower than those at Telos Lake.

Telos Lake, Piscataquis County, T. 6, R. 11, and T. 5, R. 11; inlets, Telos Brook and overflow from Chamberlain Lake through Round Pond, besides a short unnamed stream from the southeast; outlet, through Telos Canal (see above) to Webster Brook (tributary through Grand Lakes to East Branch of Penobscot River); length (approximate), 3 miles; maximum width, about seven-eighths mile; approximate area of water surface, including Round Pond, 3.85 square miles; present storage, 10 feet; additional available storage, 15 to 20 feet; drainage area not measured. Sheets 2 and 6, Maine State map.

Tenmile Lake, Aroostook County, northern Leavitt Township; inlet, a small unnamed stream on the south; outlet, to Beaver Brook (tributary through East Branch of Mattawamkeag River to Mattawamkeag River, which flows into the Penobscot);

length (approximate), 1 mile; maximum width, about one-eighth mile; area of water surface, 0.16 square mile; drainage area not measured. Sheet 6, Maine State map.

Third Lake, Piscataquis County, T. 7, R. 10; inlets, the overflow from Sink, Fourth, and Snake Ponds and Sly Brook; outlet, through Grand Lakes to East Branch of Penobscot River; length (approximate), 1¾ miles; maximum width, about 1 mile; area of water surface, 0.77 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Third Pistol Pond, Penobscot County, T. 4 N. D.; inlet, a short unnamed stream from the northwest; outlet, through Second Pistol and Hot Pistol ponds to Passadumkeag River (tributary to Penobscot River); length (approximate), 1 mile; maximum width, one-fourth mile; area of water surface, 0.20 square mile; drainage area not measured. Sheet 7, Maine State map.

Thissell Brook, Piscataquis County; rises in an unnamed pond in T. 5, R. 11; flows northward to Webster Lake (outlet, Webster Brook through Grand Lakes to East Branch of Penobscot River); receives the flow of two short unnamed streams from the west; length (approximate), 5 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Thissell Pond, Piscataquis County, T. 5, R. 11 W. E. L. S.; outlet, Thissell Brook to Webster Lake, thence by Webster Brook (tributary to East Branch of Penobscot River); area of water surface, 0.09 square mile; drainage area not measured.

Thistle Pond, Waldo County, southern Monroe Township; inlet, a small unnamed stream from the southwest; outlet, to North Branch of Marsh River (tributary to Marsh River, which flows into Penobscot River); length (approximate), one-fourth mile; maximum width, about one-fourth mile; drainage area not measured. Sheets Nos. 3 and 7, Maine State map.

Thorn Brook, Piscataquis County; rises in Spectacle Pond, in southwestern Blanchard Township; flows southeastward to South Branch of Piscataquis River (tributary to Piscataquis River, which flows into Penobscot River); receives the overflow of Spectacle, Foss, Whetstone, and Piper ponds and the flow of Bog Brook; length (approximate), 11 miles; drainage area not measured. Sheets 3 and 7, Maine State map.

Toddy Pond, Hancock County; Orland, Surrey, Penobscot, and Bluehill townships; inlets, stream from Heart Pond and nine other unnamed streams; outlet, to Alamoosook Lake on Orland River (tributary to Penobscot River); elevation, 158 feet; length (approximate), 8 miles; maximum width, one-half mile; area of water surface, 3.13 square miles; drainage area not measured. Orland and Bluehill sheets, U.S.G.S.

Toddy Pond, Waldo County, northwestern Swansville Township; outlet, an unnamed stream about 3 miles long entering North Branch of Marsh River (tributary to Marsh River, which flows into Penobscot River); length (approximate), three-fourths; mile; maximum width, about three-fourths mile; area of water surface, 0.25 square mile; drainage area not measured. Sheets Nos. 3 and 7, Maine State map.

Toddy Pond Outlet, Hancock County; rises in Toddy Pond, in central Orland Township, at an elevation of about 160 feet; flows northwestward to Alamoosook Lake on Orland River (tributary to Penobscot River); receives the flow of an unnamed stream less than one-half mile long; length, about three-fourths mile; total fall, 140 feet; drainage area not measured; Orland sheet, U.S.G.S.

Togue Stream, Penobscot County; rises in an unnamed pond in T. 3, R. 9; flows southeastward to Sandy Stream (tributary to Millinocket Lake, which has outlet to Shad Pond on West Branch of Penobscot River); receives the flow of two unnamed streams from the north; length (approximate), 2 miles; drainage area not measured. Sheet 6, Maine State map.

Tracy Pond, Penobscot County; one-fourth mile northeast of Hermon Pond, in southwestern Hermon Township; outlet, to Hermon Pond (outlet Souadabscook Stream to Penobscot River); length less than one-half mile; maximum width, about one-fourth mile; area of water surface, 0.06 square mile; drainage area not measured. Bangor and Bucksport sheets, U.S.G.S.

Tracy Pond, Piscataquis County, T. 3, R. 10 W. E. L. S.; inlet, short stream from north; outlet, short stream into Elbow Pond, thence through Katahdin Pond and Katahdin Stream to West Branch of Penobscot River; area of water surface, 0.01 square mile; drainage area not measured.

Trout Brook, Penobscot County, southeastern Burlington Township; flows southeastward to Passadumkeag River (tributary to Penobscot River); no tributaries; length (approximate), 3½ miles; drainage area not measured. Sheet 7, Maine State map.

Trout Brook, Piscataquis County; rises in western T. 5, R. 10; flows northeastward to Grand Lake on East Branch of Penobscot River; receives the overflow of Littlefield Pond and Wadleigh Brook, besides the flow of several small unnamed streams; length (approximate), 14 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Trout Brook Ponds, Penobscot County, T. 5, R. 9; inlets, the overflow of two small unnamed ponds; outlet, through Trout Brook and Grand Lakes to East Branch of Penobscot River; length (approximate), 1½ miles; maximum width, one-half mile; area of water surface, central pond, 0.11 square mile; north pond 0.48 square mile; south pond, 0.08 square mile; drainage area not measured. Sheet 6, Maine State map.

Trout Pond, Aroostook County, Moro Plantation; inlets, short stream on north and one on west; outlet, through small stream to West Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); area of water surface, 0.06 square mile; drainage area not measured.

Trout Pond, Penobscot County, T. 2 N. D.; outlet, by short stream through Saponic Pond into Passadumkeag River (tributary to Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Trout Pond, Penobscot County, extreme southern Orrington Township; elevation, 435 feet; outlet, through Browns, Mud, Brewer, and Fields ponds to Sedgeunkedunk Stream (tributary to Penobscot River); length (approximate), one-fourth mile; maximum width, one-eighth mile; area of water surface, 0.03 square mile; between point of outlet and entrance to Browns Pond, a distance of about 1 mile, there is a fall of about 210 feet; drainage area not measured. Orland, Bucksport, and Bangor sheets, U.S.G.S.

Trout Pond, Piscataquis County, T. 8, R. 10; outlet, through Hedgehog and Long ponds to Long Pond Stream (tributary through Onawa and Sebec lakes to Sebec River, which flows into Piscataquis River, a branch of the Penobscot); length (approximate), 1 mile; maximum width, one-half mile; area of water surface, 0.04 square mile; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Trout Pond, Piscataquis County, T. A 2 Gore; inlet, an unnamed stream from the northeast; outlet, through Prong and Wilson ponds to Wilson Stream (tributary through Sebec Lake and Sebec Stream to the Piscataquis, which flows into Penobscot River); length (approximate), 1 mile; maximum width, three-fourths mile; area of water surface, 0.12 square mile; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Truesdell Pond, Somerset County, T. 4, R. 18 W. E. L. S.; outlet, by short stream into North Branch of Penobscot River (tributary to West Branch of Penobscot River); area of water surface, 0.06 square mile; drainage area not measured.

Trueworthy Ponds, Hancock County, T. 3 N. D.; outlet, by short stream to Nicatous Stream and Passadumkeag River (tributary to Penobscot River); area of water surface, 0.07 square mile; drainage area not measured.

Tumble Down Dick Stream, Piscataquis County; rises in T. 1, R. 11; flows northeastward to Nahmakanta Stream (tributary to Pemadumcook Lake on West Branch of Penobscot River); receives the flow of two unnamed streams; length, about 4½ miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Turner Brook, Piscataquis County; rises in Big Pond in T. 4, R. 9; flows southeastward to Wassataquoik Stream (tributary to East Branch of Penobscot River); receives the flow of an unnamed stream from the west about 3 miles long; length (approximate), 3½ miles; drainage area not measured. Sheet 6, Maine State map.

Turtle Pond, Piscataquis County, T. 4, R. 8; outlet, through Seboeis and Endless lakes and Seboeis Stream to Piscataquis River (tributary to Penobscot River); length (approximate), three-fourths mile; maximum width, one-half mile; area of water surface, 0.20 square mile; drainage area not measured. Sheets 6 and 7, Maine State map.

Twin Lakes, North and South, Penobscot County, Indian 3 Township; treated as one body of water, as the connecting channel is as wide as either of the lakes; inlets, from Pemadumcook Lake and several small unnamed streams; outlet, through Elbow and Quakish lakes and Shad Pond on West Branch of Penobscot River; length (approximate), 4 miles; width ranges from less than 1 mile to about 4 miles; approximate area of water surface, including Pemadumcook and Ambejejus lakes, 24.9 square miles; present storage, 25 feet; drainage area not measured. Sheets 2 and 6, Maine State map.

Twin Pond, Piscataquis County, T. 2, R. 9 W. E. L. S.; outlet, by short stream into Millinocket Lake, thence into Millinocket Stream (tributary to West Branch of Penobscot River); area of water surface, 0.09 square mile; drainage area not measured.

Umbazooksus Lake, Piscataquis County, central T. 6, R. 13; inlets, overflow from Longley Pond on the west and an unnamed stream about 4 miles long from the northwest; outlet, Umbazooksus Stream to Chesuncook Lake on West Branch of Penobscot River; length (approximate), 3 miles; maximum width, about 1 mile; approximate area of water surface, 1.45 square miles; present storage, 4 feet; drainage area not measured. See page 172 of this report. Sheet 2, Maine State map.

Umbazooksus Stream, Piscataquis County; rises in Umbazooksus Lake in 6, R. 13; flows southward and southwestward to Chesuncook Lake on West Branch of Penobscot River; receives the flow of Longley Brook from the west; length (approximate), about 5 miles; after the first 1½ miles of its course it suddenly broadens, and for the remainder of its course the width of its channel varies from one-half to 1 mile; drainage area not measured. Sheet 2, Maine State map.

Upper Ebeemee Lake, Piscataquis County, on boundary between T. B, R. 10, and T. 4, R. 9; inlet, East Branch of Pleasant River, which flows through the lake also to Piscataquis River (tributary to Penobscot River); length (approximate), 1½ miles; maximum width, one-third mile; approximate area of water surface, 0.36 square mile; drainage area not measured. See also *Ebeemee Lake*. Sheets 2, 3, 6, and 7, Maine State map.

Upper Grapevine Pond, Piscataquis County, T. 7, R. 8 N. W. P.; inlet, short stream from north; outlet, through Grapevine Pond by small stream to Sebec Lake and Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.13 square mile; drainage area not measured.

Upper Greenwood Pond, Piscataquis County, T. 8, R. 9 N. W. P.; outlet, short stream through Greenwood Pond, Onawa Lake, Onawa Stream, Sebec Lake to Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.14 square mile; drainage area not measured.

Upper Hastings Brook, rises on the Penobscot-Aroostook County line between T. 7, R. 6, and T. 7, R. 5; flows southeastward to West Branch of Mattawamkeag River (tributary to Mattawamkeag River, which flows into Penobscot River); tributaries, three short unnamed streams; length (approximate), 6 miles; drainage area not measured. Sheet 6, Maine State map.

Upper Joe Mary Lake, Piscataquis County, T. A, R. 10, and Penobscot County, Long A Township; inlet, Joe Mary Brook from the southwest; outlet, through Middle and Lower Joe Mary lakes to Pemadumcook Lake on West Branch of Penobscot River; length (approximate), 3 miles; maximum width, 1 mile; approximate area of water surface, 2.98 square miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Upper Pond, Penobscot County, southern Lincoln Township; outlet, through Folson Pond to Mattanacook Pond (outlet, Mattanacook Stream to Penobscot River); length (approximate), 1 mile; maximum width, about 1 mile; approximate area of water surface, 0.79 square mile; controlled by a dam; drainage area not measured. Sheets 6 and 7, Maine State map.

Upper Wilson Pond, Piscataquis County, T. 8, R. 10 N. W. P. and Greenwood; inlets, two short streams from east, Horseshoe Stream from east, and outlet of Mountain Pond from north; outlet, by short stream to Wilson Pond, Wilson Stream, Sebec Lake to Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.60 square mile; drainage area not measured.

Wadleigh Brook, Penobscot County, T. 8, R. 6; flows in a rather circuitous course southwestward through Grand Lakes to Seboeis River (tributary to East Branch of Penobscot River); receives the flow of several small unnamed streams; length (approximate), 4½ miles; drainage area not measured. Sheet 6, Maine State map.

Wadleigh Brook, Piscataquis County; rises in a small unnamed pond in T. 6, R. 10; flows eastward to Trout Brook (tributary through Grand Lake to East Branch of Penobscot River); receives the flow of a small unnamed stream from the north; length (approximate), about 5½ miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Wadleigh Pond, Penobscot County, T. 4, Indian Purchase, W. E. L. S.; outlet, by short stream into North Twin Lake, West Branch of Penobscot River; area of water surface, 0.08 square mile; drainage area not measured.

Wadleigh Pond, Piscataquis County, T. 1, R. 11; inlet, overflow of Penobscot and Long ponds; outlet, through Rainbow Pond to Nahmakanta Lake (outlet to Pemadumcook Lake on West Branch of Penobscot River); length (approximate), 2½ miles; maximum width, three-fourths mile; area of water surface, 0.42 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

Wadleigh Pond, Piscataquis County, T. 8, R. 15; inlet, a small unnamed stream from the west; outlet, Wadleigh Stream to Poland Pond (outlet to Caucomgomuc Lake, which discharges to Chesuncook Lake on West Branch of Penobscot River); length (approximate), three-fourths mile; maximum width, one-third mile; area of water surface, 0.16 square mile; drainage area not measured. Sheet 2, Maine State map.

Wadleigh Stream, Piscataquis County; rises in Wadleigh Pond in T. 8, R. 15; flows eastward and southeastward to an unnamed pond, which flows into Poland Pond in T. 7, R. 14 (outlet to Caucomgomuc Lake and thence to Chesuncook Lake on West Branch of Penobscot River); length (approximate), 6 miles; drainage area not measured. Sheet 2, Maine State map.

Ware Pond, Penobscot County, southeastern Lee Township; inlets, two small unnamed streams on the north; outlet, through Passadumkeag River to Penobscot River; length (approximate), 1 mile; maximum width, three-fourths mile; approximate area of water surface, 0.8 square mile; drainage area not measured. Sheets 6 and 7, Maine State map.

Wassataquoik Stream, Piscataquis County; rises in T. 3, R. 10; flows northeastward, thence southeastward to East Branch of Penobscot River; receives Turner Brook and Katahdin Stream and several unnamed streams; length (approximate), 26 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Webster Brook, Piscataquis County; rises in Webster Lake in T. 6, R. 10; flows northeastward through Grand Lake to East Branch of Penobscot River; receives three unnamed streams from the northwest and the overflow of a small pond to the south; length (approximate), 8 miles; drainage area not measured. Sheets 2 and 6, Maine State map.

Webster Lake, Piscataquis County, T. 6, Rs. 10 and 11; inlets, the overflow of Coffalos Lake and Thissell Brook; outlet, Webster Brook through Grand Lake to East Branch of Penobscot River; length (approximate), 4 miles; maximum width, about one-half mile; approximate area of water surface, 1 square mile; present storage, 8 feet; additional available storage, 10 feet; drainage area not measured. (See Telos canal). Sheets 2 and 6, Maine State map.

West Branch of Mattawamkeag River, Aroostook County; rises in Rockabema Lake, in Moro Township; flows southeastward through Mattawamkeag Lake to its junction with the East Branch, in Haynesville Township, to form the Mattawamkeag (tributary to Penobscot River, in Mattawamkeag Township, Washington County); tributaries, Upper and Lower Hastings brooks, Fish Stream, Dyer, Sly, and Babcock brooks, and the overflow of Mattawamkeag Lake; length (approximate), 33 miles; drainage area above junction with East Branch of Mattawamkeag River, 352 square miles. Sheet 6, Maine State map.

West Branch of Penobscot; see *Penobscot River*.

West Branch of Pleasant River, Piscataquis County; rises in West Branch Ponds in T. A, R. 12; flows westward for about 4 miles, then turns and flows generally southeastward to its junction with East Branch of Pleasant River in T. 5, R. 8, to form Pleasant River (tributary to Piscataquis River, which flows into Penobscot River); receives the overflow of Big Lyford Pond, the flow of Hay Brook, White Brook (T. 7, R. 10), White Brook (T. B, R. 11), the overflow of Silver Lake and Houston Brook; length (approximate), 30 miles; drainage area at outlet of Silver Lake, 104 square miles. Sheets 2, 3, 6, and 7, Maine State map.

West Branch Ponds (2), Piscataquis County, T. A, R. 12; inlet of westernmost pond, an unnamed stream from the south and overflow of West Branch Ponds to the east; outlet, West Branch of Pleasant River to Pleasant River (tributary to Piscataquis River, which flows into Penobscot River); length (approximate), of westernmost pond, seven-eighths mile; maximum width, one-half mile; area of water surface, 0.78-square mile; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map,

West Branch of Souadabscook Stream, Penobscot County; rises in southwestern Newburg Township; flows northeastward to Hammond Pond, where it unites with the Souadabscook (tributary to Penobscot River); receives the flow of two unnamed streams from the south; length, about 2¾ miles; drainage area not measured. Sheets Nos. 3 and 7, Maine State map.

West Chair Pond, Piscataquis County, T. 7, R. 9 N. W. P.; outlet, by short stream into Long Pond, thence by Long Pond Stream through Onawa Lake, Onawa Stream, Sebec Lake into Sebec River (tributary to Piscataquis River, which flows into Penobscot River); area of water surface, 0.10 square mile; drainage area not measured.

West Lake, Hancock County, Tps. 3 N. D. and 40 M. D; outlet, through Nicatous Lake to Nicatous Stream (tributary to Passadumkeag River, which flows to Penobscot River; length (approximate), 2 miles; maximum width, 1¾ miles; area of water surface included in Nicatous Lake; present storage, 7 feet; drainage area not measured. Sheet 7, Maine State map.

Wheeler Stream, Penobscot County; rises in extreme northeastern Hermon Township, at an elevation of 240 feet; flows southwesterly through George Pond into Souadabscook Stream (tributary to Penobscot River); receives the flow of two unnamed streams in the upper part of its course; length (approximate), 7 miles; total fall, 115 feet; drainage area not measured. Bangor and Bucksport sheets, U.S.G.S.

Whetstone Pond, Piscataquis County, extreme southeastern Blanchard Township; outlet, through Thorn Brook to South Branch of Piscataquis River (tributary to

Piscataquis River, which flows into Penobscot River); length (approximate), 1 mile; maximum width, one-third mile; area of water surface, 0.14 square mile; drainage area not measured. Sheets 3 and 7, Maine State map.

White Brook, Piscataquis County; rises in T. B, R. 11; flows generally southwestward to Silver Lake, thence to West Branch of Pleasant River (tributary to Pleasant River, which flows to the Piscataquis, which in turn is tributary to the Penobscot); receives the flow of five short unnamed streams; length (approximate), 5 miles; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

White Brook, Piscataquis County; rises in T. 7, R. 10; flows slightly southeastward to West Branch of Pleasant River (tributary to Pleasant River, which flows to Piscataquis River, a branch of Penobscot River); receives the overflow from Green Pond from the northeast; length (approximate), 6½ miles; drainage area not measured. Sheets 2, 3, 6, and 7, Maine State map.

Whitehouse Lake, Penobscot County, T. 7, R. 7; inlet, the overflow of Snowshoe, Grand, and Seboeis lakes; outlet, through Seboeis River to East Branch of Penobscot River; length (approximate), 1¼ miles; maximum width, seven-eighths mile; approximate area of water surface, 0.84 square mile; present storage, 5 to 6 feet; drainage area not measured. Sheet 6, Maine State map.

Whitney Brook, Piscataquis County; rises in T. 5, R. 15; flows in a rather circuitous course northward and eastward to Loon Lake (outlet to Caucomgomuc Lake, which has outlet to Chesuncook Lake on West Branch of Penobscot River); receives the flow of Smith Brook and two unnamed streams; length (approximate), about 7 miles; drainage area not measured. Sheet 2, Maine State map.

Wilder Pond, Piscataquis County, Tps. 7 and 8, R. 9; outlet, Long Pond Stream through Onawa Lake, Onawa Stream, Sebec Lake, and Sebec River to Piscataquis River (tributary to Penobscot River); area of water surface, 0.02 square mile; drainage area not measured.

Williams Pond, Hancock County, northern Bucksport Township near the Penobscot-Hancock county line; inlet, a small stream about 1½ miles long from the northwest; outlet, an unnamed stream flowing southeastward to the outlet of Jacob Buck Pond to form an unnamed tributary of Orland River (tributary to Penobscot River); elevation, 263 feet; between point of outlet and its junction with the outlet of Jacob Buck Pond, a distance of about 4½ miles, there is a fall of approximately 223 feet; length, about three-fourths mile; maximum width, one-fourth mile; area of water surface, 0.19 square mile; drainage area not measured. Bucksport sheet, U.S.G.S.

Williams Pond, Piscataquis County, T. 4, R. 11 W. E. L. S.; outlet, by short stream into Sourdnahunk Stream (tributary to West Branch of Penobscot River); area of water surface, 0.04 square mile; drainage area not measured.

Wilson Pond, Piscataquis County, eastern Greenville Township; inlets, the overflow of Prong and Rum ponds and a short unnamed stream from the west; outlet, Wilson Stream (outlet through Sebec Lake to Sebec River, which flows into Piscataquis River, a tributary of the Penobscot); length (approximate), 2½ miles; maximum width, 1½ miles; approximate area of water surface, 1.52 square miles; present storage, 7 feet; several feet more storage available; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Wilson Stream, Piscataquis County; rises in Wilson Pond, in northeastern Greenville Township; flows southeastward to Sebec Lake (outlet Sebec River to Piscataquis River, which flows into Penobscot River); receives the flow of Little Wilson and Davis Streams and the overflow of Grindstone Pond, besides about four short unnamed streams; length (approximate), 20 miles; drainage area not measured. Sheets 2, 3, and 7, Maine State map.

Windy Pitch Pond, Piscataquis County, T. 3, R. 10; outlet to Sourdnahunk Stream (tributary to West Branch of Penobscot River); length (approximate), one-third mile;

maximum width, one-fourth mile; area of water surface, 0.01 square mile; drainage area not measured. Sheet 2, Maine State map.

Wyman Brook, Aroostook County; rises in T. 1, R. 5; flows southward to Mattaseunk Lake (outlet, Mattaseunk Stream to Penobscot River;) receives the flow of about seven short unnamed streams; length (approximate), 5½ miles; drainage area not measured. Sheet 6, Maine State map.

Wytopitlock Lake, Aroostook County, on boundary between T. 2, R. 4, and Glenwood Township; inlets, two unnamed streams from the north and east, respectively; outlet, through Wytopitlock Stream to Mattawamkeag River (tributary to Penobscot River;) length (approximate), 2½ miles; maximum width, 1 mile; approximate area of water surface, 1.63 square miles; drainage area not measured. Sheet 6, Maine State map.

Wytopitlock Stream, Aroostook County; rises in Wytopitlock Lake, in Glenwood Township; flows southeastward to Mattawamkeag River (tributary to Penobscot River); about 2 miles from its source it receives the flow of Brayley Brook; length (approximate), 14 miles; drainage area not measured. Sheet 6, Maine State map.

Yoke Pond, Piscataquis County, T. A, R. 11; inlet, overflow of a small unnamed pond to the northwest; outlet, to Crawford Pond (outlet by Cooper and Pratt brooks to Middle and Lower Joe Mary lakes, which have outlet to Pemadumcook Lake on West Branch Penobscot River); length (approximate), three-fourths mile; maximum width, about one-half mile; area of water surface, 0.38 square mile; drainage area not measured. Sheets 2 and 6, Maine State map.

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DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY
GEORGE OTIS SMITH, DIRECTOR

WATER-SUPPLY PAPER 280

GAGING STATIONS
MAINTAINED BY THE
UNITED STATES GEOLOGICAL SURVEY
1888-1910
AND
SURVEY PUBLICATIONS RELATING TO WATER RESOURCES

COMPILED BY
B. D. WOOD

WASHINGTON
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GAGING STATIONS MAINTAINED BY THE UNITED STATES GEOLOGICAL SURVEY FROM 1888 TO 1910 AND SURVEY PUBLICATIONS RELATING TO WATER RESOURCES.

Compiled by B. D. Wood.

INTRODUCTION.

A systematic study of the water resources of the United States was begun by the hydrographic branch (now the water-resources branch) of the United States Geological Survey in 1888. The work has consisted largely of measurements of the volume of flow of streams and studies of the conditions affecting that flow, but it has comprised also investigations of such closely allied subjects as irrigation, water storage, water powers, underground waters, and quality of water. The data collected have been published by the Survey in its annual reports, bulletins, professional papers, and water-supply papers, as listed on pages 60 to 74.

SURFACE-WATER SUPPLY PAPERS.

Owing to natural processes of evolution and to changes in governmental requirements, the character of the stream-gaging work of the Survey and the territory covered by the papers on surface-water supply have varied greatly. For the purpose of uniformity in the presentation of reports a general plan has been agreed upon by the United States Weather Bureau, the United States Forest Service, and the United States Geological Survey, according to which the country has been divided into 12 parts, whose boundaries coincide with the natural drainage lines. These divisions are given below.

I. *North Atlantic coast.*—Includes streams flowing into the Atlantic Ocean from St. John River in Maine to Rappahannock River, Va., inclusive. Principal streams in this division: St. Croix, Machias, Union, Penobscot, Kennebec, Androscoggin, Saco, Merrimac, Mystic, Blackstone, Connecticut, Hudson, Delaware, Susquehanna, Potomac, and Rappahannock. The streams drain wholly or in part the States of Connecticut, Delaware, Maine, Maryland, Massachusetts, New Jersey, New Hampshire, New York, Pennsylvania, Rhode Island, Vermont, Virginia, and West Virginia.

II. *South Atlantic coast and eastern Gulf of Mexico.*—Includes streams flowing into the Atlantic Ocean and Gulf of Mexico from James River, Va., to Pearl River, Miss., inclusive. Principal streams in this division: James, Roanoke, Cape Fear, Yadkin, Santee, Savannah, Altamaha, Apalachicola, Choctawhatchee, Mobile, and Pearl. The streams drain wholly or in part the following States: Alabama, Florida, Georgia, Mississippi, North Carolina, South Carolina, and Virginia.

III. *Ohio River basin.*—Includes Ohio River with all its tributaries. Principal streams: Allegheny, Monongahela, Beaver, Muskingum, New (or Kanawha), Scioto, Miami, Kentucky, Wabash, Cumberland, and Tennessee. The streams drain wholly or in part the following States: Alabama, Georgia, Illinois, Indiana, Kentucky, Mississippi, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and West Virginia.

IV. *St. Lawrence River basin.*—Includes streams which drain into the Great Lakes and St. Lawrence River. Principal minor basins: Lake Superior, Lake Michigan, Lake Huron, Lake Erie, Lake Ontario, and St. Lawrence River. Principal streams flowing into Lake Superior: St. Louis, Ontonagon, Dead, and Carp rivers. Streams flowing into Lake Michigan are Escanaba, Menomonee, Iron, Peshtigo, Oconto, Fox, St. Joseph, and Grand rivers. Streams flowing into Lake Huron are Thunder Bay, Au Sable, Rifle, and Flint rivers. Streams flowing into Lake Erie are Huron, St. Marys, Maumee, Sandusky, Black, and Cuyahoga. Streams flowing into Lake Ontario are Genesee, Oswego, Salmon, and Black rivers. Streams flowing into the St. Lawrence are Oswegatchie, Raquette, Richelieu (the outlet of Lake Champlain), and St. Francis River, whose principal tributary, Clyde River, reaches it through Lake Memphremagog. The streams of this section drain wholly or in part the following States: Illinois, Indiana, Michigan, Minnesota, New York, Ohio, Pennsylvania, Vermont, and Wisconsin.

V. *Hudson Bay and Upper Mississippi River basins.*—Include all streams which drain into Hudson Bay and the Mississippi above its junction with the Ohio (except the Missouri). The principal streams flowing into Hudson Bay from the United States are St. Mary River, Red River, and Rainy River. The principal tributaries of the upper Mississippi are Crow Wing, Sauk, Crow, Rum, Minnesota, St. Croix, Chippewa, Zumbro, Black, Root, Wisconsin, Wapsipinicon, Rock, Iowa, Des Moines, Illinois, Fox, and Kaskaskia rivers. The streams drain wholly or in part the following States: Illinois, Indiana, Iowa, Minnesota, Missouri, North Dakota, South Dakota, and Wisconsin.

VI.—*Missouri River basin.*—Includes the Missouri with all its tributaries. The principal streams in this basin are Red Rock, Beaverhead, and Jefferson rivers, which may be considered a continuous river forming the head of the Missouri; below the mouth of the Jefferson the principal tributaries are Madison, Gallatin, Prickly Pear, Little Prickly Pear, Dearborn, Sun, Marias, Judith, Musselshell, Milk, Yellowstone, Little Muddy, Little Missouri, Cheyenne, Niobrara, and Platte (including North Platte and South Platte rivers), Kansas, Osage, and Gasconade rivers. These streams drain wholly or in part the following States: Colorado, Iowa, Kansas, Minnesota, Missouri, Montana, Nebraska, North Dakota, South Dakota, and Wyoming.

VII. *Lower Mississippi River basin.*—Includes all streams flowing into the Mississippi below the mouth of the Ohio. The principal streams in this division are Meramec, White, Arkansas (whose chief tributaries are Huerfano, Purgatory, Cimarron, Verdigris, Neosho, Canadian, and Mora rivers), Yazoo, Homochitto, and Red rivers. The streams drain wholly or in part the following States: Arkansas, Colorado, Kansas, Kentucky, Louisiana, Mississippi, Missouri, New Mexico, Oklahoma, Tennessee, and Texas.

VIII. *Western Gulf of Mexico drainage basins.*—Include all streams draining into the western Gulf of Mexico and into the Rio Grande. Principal streams flowing into the Gulf of Mexico above the mouth of the Rio Grande: Sabine, Trinity, Brazos, Colorado River of Texas, and Guadalupe. Principal tributaries of the Rio Grande are Rio Hondo, Rio Puerco, Pecos, and Rio San Juan. The streams drain wholly or in part the following States: Colorado, Louisiana, Mexico, New Mexico, and Texas.

IX. *Colorado River basin.*—Includes the Colorado and its tributaries, of which the most important are Green River (considered the continuation of the Colorado), Grand River, Dolores, San Juan, Little Colorado, Virgin, and Gila rivers. The principal streams flowing into the Green are Newfork, Yampa, Ashley Creek, White River, Duchesne, Lake Fork, and Uinta. The principal tributaries of Grand River are Grand Lake, Frazer River, Williams Fork, Blue River, and Gunnison River. The streams of the Colorado basin drain wholly or in part the following States: Arizona, California, Colorado, Nevada, New Mexico, Utah, and Wyoming.

X. *Great Basin.*—Includes streams which do not discharge into the ocean. The basin is made up of a number of minor basins, of which the most important are Great Salt Lake, Sevier Lake, Humboldt Sink, and Truckee, Walker, Carson, and Owens River, and Honey, Mono, Malheur, Harney, Warner, Abert, Summer, Silver, and Goose Lake basins. The streams of this section drain wholly or in part the following States: California, Idaho, Nevada, Oregon, and Utah.

XI. *California.*—Includes rivers draining into the Pacific Ocean from California. Principal streams: Tia Juana, Sweetwater, San Diego, Bernardo, San Luis Rey, and Los Angeles rivers; San Joaquin River, whose principal tributaries are Kern, Kings, Merced, Tuolumne, and Stanislaus rivers; Sacramento River, whose principal tributaries are Pit, Feather, and American; and the following streams flowing into the Pacific Ocean above San Francisco Bay: Russian, Eel, Mad, and Klamath rivers. With the exception of the Klamath River, which receives a drainage from a small area in Oregon, all the streams in this division are entirely in California.

XII. *North Pacific coast.*—Includes streams flowing into the Pacific Ocean from Oregon and Washington. Most important of these are Rogue, Umpqua, and Columbia rivers and streams flowing into Puget Sound. The principal tributaries of the Columbia are Clark Fork, Kootenai, Spokane, Wenatchee, Yakima, Snake, Bruneau, Boise, Walla Walla, Umatilla, John Day, Deschute, Hood, and Willamette rivers. The following streams flow into Puget Sound: Nisqually, Puyallup, White, Snoqualmie, and Skagit. The streams of this division drain wholly or in part the following States: Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

In these basins stream-flow records have been obtained at more than 1,550 points, listed in the following pages (11–59), and the data obtained have been published in the reports tabulated on page 8.

Stream-flow data in reports of the United States Geological Survey.

[A=Annual Report; B=Bulletin; WS=Water-Supply Paper.]

Report.	Character of data.	Year.
10th A, pt. 2	Descriptive information only	
11th A, pt. 2	Monthly discharge	1884 to Sept., 1890.
12th A, pt. 2	....do	1884 to June 30, 1891.
13th A, pt. 3	Mean discharge in second-feet	1884 to Dec. 31, 1892.
14th A, pt. 2	Monthly discharge (long-time records, 1871 to 1893)	1888 to Dec. 31, 1893.
B 131	Descriptions, measurements, gage heights, and ratings	1893 and 1894.
16th A, pt. 2	Descriptive information only	
B 140	Descriptions, measurements, gage heights, ratings, and monthly discharge (also many data covering earlier years).	1895.
WS 11	Gage heights (also gage heights for earlier years)	1896.
18th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also similar data for some earlier years).	1895 and 1896.
WS 15	Descriptions, measurements, and gage heights, eastern United States, eastern Mississippi River, and Missouri River above junction with Kansas.	1897.
WS 16	Descriptions, measurements, and gage heights, western Mississippi River below junction of Missouri and Platte, and western United States.	1897.
19th A, pt. 4	Descriptions, measurements, ratings, and monthly discharge (also some long-time records).	1897.
WS 27	Measurements, ratings, and gage heights, eastern United States, eastern Mississippi River, and Missouri River.	1898.
WS 28	Measurements, ratings, and gage heights, Arkansas River and western United States.	1898.
20th A, pt. 4	Monthly discharge (also for many earlier years)	1898.
WS 35 to 39	Descriptions, measurements, gage heights, and ratings	1899.
21st A, pt. 4	Monthly discharge	1899.
WS 47 to 52	Descriptions, measurements, gage heights, and ratings	1900.
22d A, pt. 4	Monthly discharge	1900.
WS 65, 66	Descriptions, measurements, gage heights, and ratings	1901.
WS 75	Monthly discharge	1901.
WS 82 to 85	Complete data	1902.
WS 97 to 100	....do	1903.
WS 124 to 135	....do	1904.
WS 165 to 178	....do	1905.
WS 201 to 214	Complete data, except descriptions	1906.
WS 241 to 252	Complete data	1907-8.
WS 261 to 272	....do	1909.
WS 281 to 292	....do	1910.

NOTE.—No data regarding stream flow are given in the 15th and 17th annual reports.

The records at most of the stations discussed in these reports extend over a series of years. An index of the reports containing records obtained prior to 1904 has been published in Water-Supply Paper 119.

The table which follows gives, by years and drainage basins, the numbers of the papers on surface-water supply published from 1899 to 1910. The data for any particular station will be found in the reports covering the years during which the station was maintained. For example, data for Machias River at Whitneyville, Me., 1903 to 1910, are published in Water-Supply Papers 97, 124, 165, 201, 241, 261, and 281, which contain records for the New England streams from 1903 to 1910.

Numbers of water-supply papers containing results of stream measurements, 1899–1910.

	1899 [a]	1900 [b]	1901	1902	1903	1904	1905	1906	1907–8	1909	1910
North Atlantic coast (St. John River to York River)	35	47, [c] 48	65, 75	82	97	[d] 124, [e] 125, [f] 126	[d] 165, [e] 166, [f] 167	[d] 201, [e] 202, [f] 203	241	261	281
South Atlantic coast and eastern Gulf of Mexico (James River to the Mississippi)	[g] 35, 36	48	65, 75	[g] 82, 83	[g] 97, 98	[f] 126, 127	[f] 167, 168	[f] 203, 204	242	262	282
Ohio River basin	36	48, [h] 49	65, 75	83	98	128	169	205	243	263	283
St. Lawrence River and Great Lakes	36	49	65, 75	[i] 82, 83	97	129	170	206	244	264	284
Hudson Bay and upper Mississippi River	36	49	[j] 65, 66, 75	[j] 83, 85	[j] 98, 99, 100	[j] 128, 130	171	207	245	265	285
Missouri River	[k] 36, 37	49, [l] 50	66, 75	84	99	130, [m] 131	172	208	246	266	286
Lower Mississippi River	37	50	[j] 65, 66, 75	[j] 83, 84	[j] 98, 99	[j] 128, 131	[j] 169, 173	[j] 205, 209	247	267	287
Western Gulf of Mexico	37	50	66, 75	84	99	132	174	210	248	268	288
Colorado River	[n] 37, 38	50	66, 75	85	100	133	175, [o] 177	211	249	269	289
Great Basin	38, [p] 39	51	66, 75	85	100	133, [q] 134	176, [q] 177	212, [q] 213	250, [q] 251	270, [q] 271	290, [q] 291
California	38, [r] 39	51	66, 75	85	100	134	177	213	251	271	291
North Pacific coast	38	51	66, 75	85	100	135	[s] 177, 178	214	252	272	292

[a] Rating tables and index to Water-Supply Papers 35–39 contained in Water-Supply Paper 39.

[b] Rating tables and index to Water-Supply Papers 47–52 and data on precipitation, wells, and irrigation in California and Utah contained in Water-Supply Paper 52.

[c] Wissahickon and Schuylkill rivers to James River.

[d] New England rivers only.

[e] Hudson River to Delaware River, inclusive.

[f] Susquehanna River to Yadkin River, inclusive.

[g] James River only.

[h] Scioto River.

[i] Lake Ontario and tributaries to St. Lawrence River proper.

[j] Tributaries of Mississippi from east.

[k] Gallatin River.

[l] Loup and Platte rivers near Columbus, Nebr., and all tributaries below junction with Platte.

[m] Platte and Kansas rivers.

[n] Green and Gunnison rivers and Grand River above junction with Gunnison.

[o] Below junction with Gila.

[p] Mohave River only.

[q] Great Basin in California, excepting Truckee and Carson drainage basins.

[r] Kings and Kern Rivers only.

[s] Rogue, Umpqua, and Siletz rivers only.

In these papers and in the following list the stations are arranged in downstream order. The main stem of any river is determined by measuring or estimating the drainage area; that is, the headwater stream having the largest drainage area is considered the continuation of the main stream and local changes in name and lake surface are disregarded. All stations from the source to the mouth of the main stem of the river are presented first, and the tributaries in regular order from source to mouth follow, the streams in each tributary basin being listed before those of the next basin below.

The exceptions to this rule occur in the records for Mississippi River, which are given in four parts, as indicated above, and in the records for large lakes, where it is simpler to take up the streams in regular order around the rim of the lake than to cross back and forth over the lake surface.

Special reports embodying the results of stream-gaging work have from time to time been published by the Survey, and also by State organizations cooperating with the Federal Bureau. A list of the more important of these reports follows:

Water resources of the State of Colorado, by A. L. Fellows: Water-Supply Paper U. S. Geol. Survey No. 74, 1902.

California hydrography, by J. B. Lippincott: Water-Supply Paper U. S. Geol. Survey No. 81, 1903.

The water powers of Texas, by T. U. Taylor: Water-Supply Paper U. S. Geol. Survey No. 105, 1904.

Water powers of Alabama, with an appendix on stream measurements in Mississippi, by B. M. Hall: Water-Supply Paper U. S. Geol. Survey No. 107, 1904.

Hydrography of the Susquehanna River drainage basin, by J. C. Hoyt and R. H. Anderson: Water-Supply Paper U. S. Geol. Survey No. 109, 1905.

Water powers of northern Wisconsin, by L. S. Smith: Water-Supply Paper U. S. Geol. Survey No. 156, 1906.

The Potomac River basin: geographic history; rainfall and stream flow; pollution, typhoid fever, character of water; relation of soils and forest cover to quality and quantity of surface water; effect of industrial wastes on fishes, by Bailey Willis, R. H. Bolster, H. N. Parker, W. W. Ashe, and M. C. Marsh: Water-Supply Paper U. S. Geol. Survey No. 192, 1907.

Water supply of the Nome region, Seward Peninsula, Alaska, by J. C. Hoyt and F. F. Henshaw: Water-Supply Paper U. S. Geol. Survey No. 196, 1907.

Water resources of Georgia, by B. M. and M. R. Hall: Water-Supply Paper U. S. Geol. Survey No. 197, 1907.

Water resources of the Kennebec River basin, by H. K. Barrows: Water-Supply Paper U. S. Geol. Survey No. 198, 1907.

Water-supply investigations in Alaska, 1906-7; Nome and Kougarok regions, Seward Peninsula; Fairbanks district; Yukon-Tanana region, by Fred F. Henshaw and C. C. Covert: Water-Supply Paper U. S. Geol. Survey No. 218, 1908.

Water-supply investigations in Alaska, 1907-8, by C. C. Covert and C. E. Ellsworth: Water-Supply Paper U. S. Geol. Survey No. 228, 1909.

Surface waters of Nebraska, by J. C. Stevens: Water-Supply Paper U. S. Geol. Survey No. 230, 1909.

Water powers of the Cascade Range, Part I, Southern Washington, by John C. Stevens: Water-Supply Paper U. S. Geol. Survey No. 253.

Water resources of the Penobscot River basin, Maine, by H. K. Barrows and C. C. Babb: Water-Supply Paper U. S. Geol. Survey No. 279.
Water powers of North Carolina: Bull. North Carolina Geol. Survey.
Hydrography of Virginia, by N. C. Grover and R. H. Bolster: Geological Series, Bull. No. 3, 1895–1905.
Report of water resources investigations of Minnesota during 1909–10, by State Drainage Commission.

GAGING STATIONS.

I. NORTH ATLANTIC COAST BASINS.

[St. John River to York River, inclusive.]

ST. JOHN RIVER BASIN.

St. John River near Dickey, Me., 1910.
St. John River at Fort Kent, Me., 1905–1910.
    Allagash River near Allagash, Me., 1910.
    St. Francis River at St. Francis, Me., 1910.
    Fish River at Wallagrass, Me., 1903–1908.
    Madawaska River at St. Rose du Degile, P. Q., 1910.
    Arrostook River at Fort Fairfield, Me., 1903–1910.

ST. CROIX RIVER BASIN.

St. Croix River near Woodland, Me., 1902–1910.
    Grand Lake:
        West Branch St. Croix River at Baileyville, Me., 1910.

MACHIAS RIVER BASIN.

Machias River at Whitneyville, Me., 1903–1910.

UNION RIVER BASIN.

Union River, West Branch (head of Union River) at Amherst, Me., 1909–10.
Union River, West Branch, near Mariaville, Me., 1909.
Union River at Ellsworth, Me., 1909–10.
    Union River, East Branch, near Waltham, Me., 1909.
    Webbs Brook at Waltham, Me., 1909.
    Green Lake (head of Green Lake Stream) at Green Lake, Me., 1909–10.
    Green Lake Stream at Lakewood, Me., 1909–10.
    Branch Lake (head of Branch Lake Stream) near Ellsworth, Me., 1909–10.
    Branch Lake Stream near Ellsworth, Me., 1909–10.

PENOBSCOT RIVER BASIN.

Penobscot River, West Branch (head of Penobscot) at Millinocket, Me., 1901–1910.
Penobscot River at West Enfield, Me., 1901–1910.
Penobscot River at Sunk Haze Rips, near Costigan, Me., 1899–1900.
    Penobscot River, East Branch, at Grindstone, Me., 1902–1910.
    Mattawamkeag River at Mattawamkeag, Me., 1902–1910.
    Piscataquis River near Foxcroft, Me., 1902–1910.
    Cold Stream Pond (head of Cold Stream), 1910.
    Cold Stream at Enfield, Me., 1904–1906.
    Kenduskeag Stream near Bangor, Me., 1908–10.
    Phillips Lake Outlets at Holden and Dedham, Me., 1904–1908.

KENNEBEC RIVER BASIN.

Moose River (head of Kennebec River) at Rockwood, Me., 1902–1908.
Moosehead Lake (on Kennebec River) at Greenville, Me., 1903–1908 (stage only).
Moosehead Lake at East Outlet, Me., 1895–1909 (stage only).

Kennebec River at The Forks, Me., 1901–1910.
Kennebec River at Bingham, Me., 1907–1910.
Kennebec River at North Anson, Me., 1901–1907.
Kennebec River at Waterville, Me., 1891–1910.
Kennebec River at Gardiner, Me., 1785–1910.
  Roach River at Roach River, Me., 1901–1908.
  Dead River at The Forks, Me., 1901–1907 and 1910.
  Carrabassett River at North Anson, Me., 1901-1907.
  Sandy River near Farmington, Me., 1910.
  Sandy River at Madison, Me., 1904–1908.
  Sebasticook River at Pittsfield, Me., 1908–9.
  Messalonskee Stream at Waterville, Me., 1903–1905.
  Cobbosseecontee Lake, Me., 1910.
  Cobbosseecontee Stream at Gardiner, Me., 1890–1909.

ANDROSCOGGIN RIVER BASIN.

Rangeley Lake (head of Androscoggin River), Me., 1910.
Androscoggin River at Errol Dam, N. H., 1905–1910.
Androscoggin River at Gorham, N. H., 1903 (fragmentary).
Androscoggin River at Shelburne, N. H., 1903–1907 and 1910.
Androscoggin River at Rumford Falls, Me., 1892–1910.
Androscoggin River at Dixfield, Me., 1902–1908.
  Auburn Lake, Me., 1910.

PRESUMPSCOT RIVER BASIN.

Presumpscot River at outlet of Sebago Lake, Me., 1887–1909.

SACO RIVER BASIN.

Saco River near Center Conway, N. H., 1903–1910.
Saco River at West Buxton, Me., 1907–1910.

MERRIMAC RIVER BASIN.

Pemigewasset River (head of Merrimac River) at Plymouth N. H., 1886–1910.
Merrimac River at Franklin Junction, N. H., 1903–1910.
Merrimac River at Garvins Falls, N. H., 1904–1910.
Merrimac River at Lawrence, Mass., 1890–1910.
  Contoocook River at West Hopkinton, N. H., 1903–1907.
  Suncook River at East Pembroke, N. H., 1904–5.
  Souhegan River at Merrimac, N. H., 1909–10.
  South Branch of Nashua River at Clinton, Mass., 1896–1910.
  Sudbury River at Framingham, Mass., 1875–1910.
  Lake Cochituate at Cochituate, Mass., 1863–1910.

MYSTIC RIVER BASIN.

Mystic Lake near Boston, Mass., 1898–1897.

TAUNTON RIVER BASIN.

Matfield River at Elmwood, Mass., 1909–10.
  Satucket River near Elmwood, Mass., 1909–10.

TENMILE RIVER BASIN.

Tenmile River near Rumford, R. I., 1909.

BLACKSTONE RIVER BASIN.

Blackstone River at Woonsocket, R. I., 1904–5.
Blackstone River at Berkeley, R. I., 1900–1901.
  Branch River at Branch Village, R. I., 1909–10.

WOONASQUATUCKETT RIVER BASIN.

Woonasquatuckett River, Olneyville, R. I., 1910.

PAWTUXET RIVER BASIN.

Pawtuxet River at Harris, R. I., 1909–10.

PAWCATUCK RIVER BASIN.

Wood River at Hope Valley, R. I., 1909–10.

THAMES RIVER BASIN.

Shetucket River at Willimantic, Conn., 1904–5.

CONNECTICUT RIVER BASIN.

- Connecticut River at Orford, N. H., 1900–10.
- Connecticut River at Sunderland, Mass., 1904–10.
- Connecticut River at Holyoke, Mass., 1880–1898.
- Connecticut River at Hartford, Conn., 1896–1908.
  - Israel River above South Branch at Jefferson Highlands, N. H., 1903–1906.
  - Israel River below South Branch at Jefferson Highlands, N. H., 1903–1907.
  - Passumpsic River at St. Johnsbury Center, Vt., 1903 and 1909–10.
  - Ammonoosuc River at Bretton Woods, N. H., 1903–1907.
    - Zealand River at Twin Mountain, N. H., 1903–1907.
    - Little River at Twin Mountain, N. H., 1904–5.
  - White River at Sharon, Vt., 1903–4 and 1909–10.
  - Ashuelot River at Winchester, N. H., 1903–4.
  - Ashuelot River at Hinsdale, N. H., 1907–1910.
  - Millers River at Wendell, Mass., 1909–10.
    - Moss Brook, Wendell, Me., 1910.
  - Deerfield River at Hoosac Tunnel, Mass., 1909–10.
  - Deerfield River at Shelburne Falls, Mass., 1907–1910.
  - Deerfield River at Deerfield, Mass., 1904–5.
  - Ware River at Ware, Mass., 1904–1908 and 1910.
  - Chicopee River:
    - Burnshirt River near Templeton, Mass., 1909–10.
    - Swift River, West Ware, Mass., 1910.
    - Quaboag River at West Warren, Mass., 1904–1907.
    - Quaboag River at West Brimfield, Mass., 1909–10.
  - Westfield River at Knightville, Mass., 1909–10.
  - Westfield River at Russell, Mass., 1904–5.
    - Westfield River, Middle Branch, Goss Heights, Mass., 1910.
    - Westfield Little River near Blandford, Mass., 1905–1910.
  - Salmon River at Leesville, Conn., 1905–6.

HOUSATONIC RIVER BASIN.

- Housatonic River at Gaylordsville, Conn., 1900–1910.
  - Tenmile River at Dover Plains, N. Y., 1901–1903.

MIANUS RIVER BASIN.

- Mianus River near Stamford, Conn., 1903.
- Mianus River at Bedford, N. Y., 1903.

BYRAM RIVER BASIN.

- Byram River at Pemberwick, Conn., 1903.
  - Byram River, West Branch, near Port Chester, N. Y., 1903.
  - Byram River, East Branch, near Greenwich, Conn., 1903.
  - Byram River, Middle Branch, near Riverville, Conn., 1903.

HUDSON RIVER BASIN.

- Hudson River at North Creek, N. Y., 1907–1910.
- Hudson River at Thurman, N. Y., 1907–1910.
- Hudson River at Fort Edward, N. Y., 1895–1908.
- Hudson River at Mechanicsville, N. Y., 1888–1910.
  - Indian Lake Reservoir at Indian Lake, N. Y., 1900–1910.
  - Schroon Lake (head of Schroon River) at Pottersville, N. Y., 1908–1910.
  - Schroon River at Riverbank, N. Y., 1907–1910.
  - Schroon River at Warrensburg, N. Y., 1895–1902.
  - Sacandaga River at Wells, N. Y., 1907–1910.
  - Sacandaga River at Northville, N. Y., 1907–1910.
  - Sacandaga River near Hadley, N. Y., 1907–1910.
  - Sacandaga River (a cable) near Hadley, N. Y., 1910.
  - Sacandaga River at Union Bag & Paper Co.'s Mill, at Hadley, N. Y., 1909–10.
  - Sacandaga River, West Branch, Whitehouse, N. Y., 1910.
  - Battenkill River at Battenville, N. Y., 1908.
  - Fish Creek at Burgoyne, N. Y., 1904–5 and 1908.
  - Hoosic River above Eagle Bridge, N. Y., 1910.
  - Hoosic River at Buskirk, N. Y., 1903–1909.
  - Mohawk River at Ridge Mills near Rome, N. Y., 1898–1900.
  - Mohawk River at Utica, N. Y., 1901–1903.
  - Mohawk River at Little Falls, N. Y., 1898–1910.
  - Mohawk River at Rocky Rift Dam near Indian Castle, N. Y., 1901.
  - Mohawk River at Schenectady, N. Y., 1899–1901.
  - Mohawk River at Rexford Flats, N. Y., 1898–1901.
  - Mohawk River at Dunsbach Ferry, N. Y., 1898–1910.
    - Ninemile Creek at Stittville, N. Y., 1898–9.
    - Oriskany Creek at Coleman, N. Y., 1904–1906.
    - Oriskany Creek at Wood Road Bridge near Oriskany, N. Y., 1901–1904.
    - Oriskany Creek at Oriskany State Dam near Oriskany, N. Y., 1898–1906.
    - Saquoit Creek at New York Mills, N. Y., 1898–1900.
    - Nail Creek at Utica, N. Y., 1904.
    - Reels Creek at Deerfield, N. Y., 1901–1904
    - Reels Creek at Utica, N. Y., 1901–2.
      - Johnston Brook at Deerfield, N. Y., 1903–1905.
    - Starch Factory Creek at New Hartford, N. Y., 1903–1906.
      - Graefenberg Creek at New Hartford, N. Y., 1903–1906.
      - Sylvan Glen Creek at New Hartford, N. Y., 1900–1906.
    - West Canada Creek at Twin Rock Bridge near Trenton Falls, N. Y., 1900–1910.
    - West Canada Creek at Middleville, N. Y., 1898–1901.
    - West Canada Creek at Kast Bridge, N. Y., 1905–1910.
    - East Canada Creek at Dolgeville, N. Y., 1898–1910.
    - Garoga Creek 3 miles above junction with Mohawk, 1898–9.
    - Cayadutta Creek at Johnstown, N. Y., 1898–1900.
    - Schoharie Creek at Prattsville, N. Y., 1902–1910.
    - Schoharie Creek at Schoharie Falls above Mill Point, 1900–1901.
    - Schoharie Creek at Mill Point, N. Y., 1900–1903.
    - Schoharie Creek at Fort Hunter, 1898–1901.
    - Schoharie Creek at Erie Canal Aqueduct below Fort Hunter, N. Y., 1900.
  - Quackenkill Creek at Quackenkill, N. Y., 1894.
  - Normanskill Creek at French's Mill, N. Y., 1891.
  - Kinderhook Creek at Wilson's Dam near Garfield, N. Y., 1893–4.
  - Kinderhook Creek at East Nassau, N. Y., 1892–1894.
  - Kinderhook Creek at Rossman, N. Y., 1906–1910.

Hudson River—Continued.
- Catskill Creek at South Cairo, N. Y., 1901–1907.
- Esopus Creek at Olivebridge, N. Y., 1903–4.
- Esopus Creek near Olivebridge, N. Y. (weir station), 1906–1910.
- Esopus Creek at Kingston, N. Y., 1901–1909.
- Esopus Creek at Mount Marion, N. Y., 1907–1910.
- Rondout Creek at Rosendale, 1901–1903, 1905–1910.
  - Diversion to Delaware and Hudson Canal at Rosendale, 1901–1907.
  - Wallkill River at Newpaltz, N. Y., 1901–1903.
- Wappinger Creek at Wappinger Falls, N. Y., 1903–1905.
- Fishkill Creek at Glenham, N. Y., 1901–1903.
- Foundry Brook at Coldspring, N. Y., 1902–3.
- Croton River at Croton Dam, near Croton Lake, N. Y., 1868–1903.

PASSAIC RIVER BASIN.

Passaic River at Millington, N. J., 1903–1906.
Passaic River near Chatham, N. J., 1902–1910.
Passaic River at Two Bridges (Mountain View), N. J., 1901–1903.
- Rockaway River at Boonton, N. J., 1903–4.
- Pompton River at Pompton Plains, N. J., 1903–4.
- Pompton River at Two Bridges (Mountain View), N. J., 1901–1903.
  - Ramapo River near Mahwah, N. J., 1903–1908.
    - Wanaque River at Wanaque, N. J., 1903–1905.

RARITAN RIVER BASIN.

Raritan River at Stanton, N. J., 1903–1906.
Raritan River at Finderne, N. J., 1903–1907.
Raritan River at Boundbrook, N. J., 1903–1909.
- Raritan River, North Branch, at Pluckemin, N. J., 1903–1906.
- Millstone River at Millstone, N. J., 1903–4.

DELAWARE RIVER BASIN.

Delaware River, East Branch (head of Delaware River), at Hancock, N. Y., 1902–1910.
Delaware River at Port Jervis, N. Y., 1904–1910.
Delaware River at Riegelsville, N. J., 1906–1910.
Delaware River at Lambertville, N. J., 1897–1908.
- Delaware River, West Branch, at Hancock, N. Y., 1902–1910.
- Mongaup River near Rio, N. Y., 1909–10.
- Neversink River at Godeffroy, N. Y., 1903, 1909–10.
- Neversink River at Port Jervis, N. Y., 1902–3.
- Paulins Kill at Columbia, N. J., 1908–1909.
- Lehigh River at South Bethlehem, Pa., 1902–1905, 1909–10.
- Lehigh River at Easton, Pa., 1909.
- Musconetcong River at Asbury, N. J., 1903.
- Musconetcong River near Bloomsbury, N. J., 1903–1907.
- Tohickon Creek at Point Pleasant, Pa., 1883–1910.
- Neshaminy Creek below Forks, Pa., 1884–1910.
- Schuylkill River near Philadelphia, Pa., 1898–1910.
  - Perkiomen Creek near Frederick, Pa., 1884–1910.
  - Wissahickon Creek at Philadelphia, Pa., 1897–1906.

SUSQUEHANNA RIVER BASIN.

Susquehanna River at Colliersville, N. Y., 1907–8.
Susquehanna River at Binghamton, N. Y., 1901–1910.
Susquehanna River at Wysox, Pa., 1908–1909.
Susquehanna River at Wilkes-Barre, Pa., 1899–1910.

- Susquehanna River at Danville, Pa., 1899–1910.
- Susquehanna River at Harrisburg, Pa., 1891–1910.
- Susquehanna River at McCalls Ferry, Pa., 1902–1910.
  - Chenango River at South Oxford, N. Y., 1903.
  - Chenango River near Greene, N. Y., 1908.
  - Chenango River at Binghamton, N. Y., 1901–1910.
    - Eaton Brook, Madison County, N. Y., 1835.
    - Madison Brook, Madison County, N. Y., 1835.
    - Tioughnioga River at Chenango Forks, N. Y., 1903.
  - Cayuta Creek at Waverly, N. Y., 1898–1902. (Data in Water-Supply Paper, 109 only.)
  - Chemung River at Chemung, N. Y., 1903–1910.
  - Susquehanna River, West Branch, at Williamsport, Pa., 1895–1910.
  - Susquehanna River, West Branch, at Allenwood, Pa., 1899–1902.
  - Juniata River at Newport, Pa., 1899–1910.
  - Broad Creek at Mill Green, Md., 1904–1909.
  - Octoraro Creek at Rowlandsville, Md., 1896–1899.
  - Deer Creek near Churchville, Md., 1904–1909.

GUNPOWDER RIVER BASIN.

- Gunpowder Falls River at Glencoe, Md., 1904–1909.
  - Little Gunpowder Falls River near Belair, Md., 1904–1909.

PATAPSCO RIVER BASIN.

- Patapsco River at Woodstock, Md., 1896–1909.

PATUXENT RIVER BASIN.

- Patuxent River at Laurel, Md., 1896–1898.

POTOMAC RIVER BASIN.

- Potomac River, North Branch (head of Potomac River), at Piedmont, W. Va., 1899–1906.
- Potomac River, North Branch, at Cumberland, Md., 1894–1897.
- Potomac River at Great Cacapon, W. Va., 1894–1896.
- Potomac River at Point of Rocks, Md., 1895–1910.
  - Savage River at Bloomington, Md., 1905–6.
  - Georges Creek at Westernport, Md., 1905–6.
  - Wills Creek near Cumberland, Md., 1905–6.
  - Potomac River, South Branch, near Springfield, W. Va., 1894–1896, 1899–1906.
  - Opequan Creek near Martinsburg, W. Va., 1905–6.
  - Tuscarora Creek at Martinsburg, W. Va., 1905.
  - Antietam Creek near Sharpsburg, Md., 1897–1905.
  - South River at Basic City, Va., 1905–6.
  - South River at Port Republic, Va., 1895–1899.
  - Shenandoah River, South Fork (head of Shenandoah River), near Front Royal, Va., 1899–1906.
  - Shenandoah River at Millville, W. Va., 1895–1909.
    - North River at Port Republic, Va., 1895–1899.
      - Lewis Creek near Staunton, Va., 1905–6.
      - Cooks Creek at Mount Crawford, Va., 1905–6.
    - Elk Run at Elkton, Va., 1905–6.
    - Hawksbill Creek, near Luray, Va., 1905–6.
    - Shenandoah River, North Fork, near Riverton, Va., 1899–1906.
      - Passage Creek at Buckton, Va., 1905–6.
    - Monocacy River near Frederick, Md., 1896–1910.
    - Goose Creek near Leesburg, Va., 1909–10.
    - Rock Creek at Zoological Park, D. C., 1897–1900.
    - Rock Creek at Lyons Mill, D. C., 1892–1894.

RAPPAHANNOCK RIVER BASIN.

Rappahannock River near Fredericksburg, Va., 1907-1910.

II. SOUTH ATLANTIC COAST AND EASTERN GULF OF MEXICO.

JAMES RIVER BASIN.

Jackson River (head of James) at Covington, Va., 1907-8.
James River at Buchanan, Va., 1895-1910.
James River at Holcomb Rock, Va., 1900-1910.
James River at Cartersville, Va., 1899-1910.
  Cowpasture River near Clifton Forge, Va., 1907-8.
  James River, North Branch, near Glasgow, Va., 1895-1905.
  Appomattox River at Mattoax, Va., 1900-1905.

ROANOKE RIVER BASIN.

Roanoke River at Roanoke, Va., 1896-1910.
Roanoke River at Randolph, Va., 1900-1906.
Roanoke River above the Dan at Clarksville, Va., 1895-1898.
Roanoke River at Neal, N. C., 1896-1903.
  Tinker Creek at Roanoke, Va., 1907-8.
  Back Creek near Roanoke, Va., 1907-8.
  Dan River at Madison, N. C., 1903-1908.
  Dan River at South Boston, Va., 1900-1907.
  Dan River at Clarksville, Va., 1895-1898.
    Banister River at Houston, Va., 1904-5.

TAR RIVER BASIN.

Tar River near Tarboro, N. C., 1896-1900.

NEUSE RIVER BASIN.

Neuse River near Selma, N. C., 1896-1900.

CAPE FEAR BASIN.

Haw River (head of Cape Fear River) near Moncure, N. C., 1898-9.
Cape Fear River near Fayetteville, N. C., 1889-1903.
  Deep Creek near Cumnock, N. C., 1900-1902.
  Deep Creek near Moncure, N. C., 1898-9.
  Rockfish Creek near Brunt, N. C., 1902-3.

YADKIN RIVER BASIN.

Yadkin (or Pedee) River at North Wilkesboro, N. C., 1903-1909.
Yadkin River near Siloam, N. C., 1900-1.
Yadkin River near Salisbury, N. C., 1895-1909.
Yadkin River near Norwood, N. C., 1896-1899.
Yadkin River near Pedee, N. C., 1906-1910.
Pedee River at Cheraw, S. C., 1909-10

SANTEE RIVER BASIN.

Catawba River (head of Santee River) at Old Fort, N. C., 1907.
Catawba River near Morganton, N. C., 1900-1909.
Catawba River near Catawba, N. C., 1896-1905.
Catawba River near Rockhill, S. C., 1895-1903.
Wateree River (lower part of Catawba) near Camden, S. C., 1904-1910.
  Mill Creek at Old Fort, N. C., 1907.
  Linville River at Fonta Flora, N. C., 1907-8.

Wateree River—Continued.
- Linville River near Bridgewater, N. C., 1900.
- Johns River at Collettsville, N. C., 1907.
- Johns River near Morganton, N. C., 1900–1.
- Broad River (of the Carolinas) (head of Congaree River) at Uree, N. C., 1907–1909.
- Broad River (of the Carolinas) at Dellinger, S. C., 1900–1.
- Broad River (of the Carolinas) near Gaffney, S. C., 1896–1899.
- Broad River (of the Carolinas) at Alston, S. C., 1896–1907.
  - Green River near Saluda, N. C., 1907–1909.
  - Second Broad River near Logan's Store, N. C., 1907–8.
  - Saluda River near Waterloo, S. C., 1896–1905
  - Saluda River near Ninety Six, S. C., 1905.

SAVANNAH RIVER BASIN.

- Chattooga River (head of Savannah) near Clayton, Ga., 1907–8.
- Tugaloo River (continuation of Chattooga River) near Toccoa, Ga., 1907–8.
- Tugaloo River near Madison, S. C., 1898–1910.
- Savannah River near Calhoun Falls, S. C., 1896–1903.
- Savannah River at Woodlawn, S. C., 1905–1910.
- Savannah River at Augusta, Ga., 1899–1906.
  - Stekoa Creek near Clayton, Ga., 1907–8.
  - Tallulah River at Tallulah Falls, Ga., 1900–1910.
  - Chauga River near Madison, S. C., 1907.
  - Seneca River near Clemson College, S. C., 1903–1905.
  - Broad River (of Georgia) near Carlton, Ga., 1897–1910.
  - Ogeechee River near Millen, Ga., 1903.
    - Williamsons Swamp Creek near Davisboro, Ga., 1903–4.
    - Cannoochee River near Groveland, Ga., 1903–1907.

ALTAMAHA RIVER BASIN.

- South River (head of Ocmulgee River, which is head of Altamaha) near Lithonia, Ga., 1903–4.
- Ocmulgee River near Jackson, Ga., 1906–1910.
- Ocmulgee River near Flovilla, Ga., 1901–1905.
- Ocmulgee River at Macon, Ga., 1893–1910.
  - Yellow River at Almon, Ga., 1897–1901.
  - Alcovy River near Covington, Ga., 1901–1904.
  - Alcovy River near Stewart, Ga., 1905–6.
  - Towaliga River near Juliette, Ga., 1899–1901.
  - Oconee River at Barnett Shoals, near Watkinsville, Ga., 1901–2.
  - Oconee River near Greensboro, Ga., 1903–1910.
  - Oconee River at Carey, Ga., 1896–1898.
  - Oconee River at Fraleys Ferry, near Milledgeville, Ga., 1905–1910.
  - Oconee River at Milledgeville, Ga., 1893–1905.
  - Oconee River at Dublin, Ga., 1897–1910.
    - Middle Oconee River near Athens, Ga., 1901–2.
    - Apalachee River near Buckhead, Ga., 1901–1908.
  - Ohoopee River near Reidsville, Ga., 1903–1907.
- Silver Springs River (head of St. John River) near Silver Springs, Fla., 1906.

SUWANEE RIVER BASIN.

- Suwanee River near White Springs, Fla., 1906–1908.

APALACHICOLA RIVER BASIN.

- Chattahoochee River (head of Apalachicola River) near Aerial, Ga., 1907–1909.
- Chattahoochee River near Leaf, Ga., 1907.

Chattahoochee River near Gainesville, Ga., 1901–1903.
Chattahhochee River near Buford, Ga., 1901.
Chattahoochee River near Norcross, Ga., 1902–1910.
Chattahoochee River near Oakdale, Ga., 1895–1904.
Chattahoochee River at West Point, Ga., 1896–1910.
Chattahoochee River at Alaga, Ala., 1908–1910.
    Soque River near Demorest, Ga., 1904–1909.
    Sweetwater Creek near Austell, Ga., 1904–5.
    Flint River near Woodbury, Ga., 1900–1910.
    Flint River near Mussela, Ga., 1907.
    Flint River near Montezuma, Ga., 1905–1910.
    Flint River at Albany, Ga., 1902–1910.
    Flint River at Bainbridge, Ga., 1908–1910.
        Kinchafoonee Creek near Leesburg, Ga., 1905–1909.
        Kinchafoonee Creek near Albany, Ga., 1903.
            Muckalee Creek near Albany, Ga., 1903.
    Ichawaynochaway Creek at Milford, Ga., 1905–1907.

CHOCTAWHATCHEE RIVER BASIN.

Choctawhatchee River near Newton, Ala., 1906–1908.
Choctowhatchee River near Geneva, Ala., 1904.
    Double Bridge Creek at Geneva, Ala., 1904.
    Pea River at Pera, Ala., 1904–1910.
    Pea River at Elba, Ala., 1906.

ESCAMBIA RIVER BASIN.

Conecuh River at Beck, Ala., 1904–1910.

MOBILE RIVER BASIN.

Cartecay River (head of Mobile River) near Cartecay, Ga., 1904–5, 1907.
Coosawattee River (continuation of Cartecay River) at Carters, Ga., 1896–1908.
Costanaula River (continuation of Coosawattee River) at Resaca, Ga., 1896–1910.
Coosa River (continuation of Costanaula River) at Rome, Ga., 1897–1903.
Coosa River at Lock No. 4, Ala., above Riverside, Ala., 1890–1901.
Coosa River at Riverside, Ala., 1896–1910.
Coosa River at Lock No. 5, near Childersburg, Ala., 1892–1897.
Coosa River near Wetumpka, Ala., 1896–1898.
Alabama River (continuation of Coosa River) at Montgomery, Ala., 1899–1903.
Alabama River at Selma, Ala., 1900–1910.
    Ellijay River at Ellijay, Ga., 1907.
    Conasauga River at Beaverdale, Ga., 1907–8.
    Etowah River near Ball Ground, Ga., 1907–1910.
    Etowah River at Canton, Ga., 1892–1905.
    Etowah River near Rome, Ga., 1904–1910.
    Etowah River at Rome, Ga., 1903.
        Amicalola River near Potts Mountain, Ga., 1907–8.
    Choccolocco Creek at Jenifer, Ala., 1903–1908.
    Talladega Creek at Nottingham, Ala., 1900–1904.
    Tallapoosa River at Sturdevant, Ala., 1900–1910.
    Tallapoosa River near Susanna, Ala., 1900–1901.
    Tallapoosa River at Milstead, Ala., 1897–1903.
        Hillabee Creek near Alexander City, Ala., 1900–1903.
        Big Sandy Creek near Dadeville, Ala., 1900–1901.
    Cahaba River at Centerville, Ala., 1901–1908.
    Tombigbee River at Columbus, Miss., 1900–1910.

- Alabama River—Continued.
  - Tombigbee River at Epes, Ala., 1900–1910.
    - Black Warrior River near Cordova, Ala., 1900–1910.
      - Black Warrior River near Coal, Ala., 1908–1910.
      - Black Warrior River at Tuscaloosa, Ala., 1889–1905.
        - Clear Creek near Elk, Ala., 1904–5.
        - Locust Fork of Black Warrior River at Palos, Ala.. 1901–1905.
          - Village Creek near Mulga, Ala., 1909.
            - Camp Branch near Ensley, Ala., 1908–1910.
            - Venison Branch near Mulga, Ala., 1908–9.

PEARL RIVER BASIN.

- Pearl River at Jackson, Miss., 1901–1910.
  - Bogue Chitto at Warnerton, La., 1906.

III. OHIO RIVER BASIN.

- Allegheny River (head of Ohio River) at Red House, N. Y., 1903–1910.
- Allegheny River at Kittanning, Pa., 1904–1910.
  - Conewango Creek:
    - Chautauqua Lake outlet (Chadakoin River) near Jamestown, N. Y., 1895.
    - Chadakoin River near Jamestown, N. Y., 1904–5.
  - Kiskiminitas River at Avonmore, Pa., 1907–1910.
  - Kiskiminitas River at Salina, Pa., 1904–1906.
    - Blacklick Creek at Blacklick, Pa., 1904–1910.
  - Tygart River (head of Monongahela River) at Belington, W. Va., 1907–1910.
  - Tygart River at Fetterman, W. Va., 1907–1910.
  - Monongahela River at Lock No. 4, Pa., 1886–1906. Flood stage record only.
    - Buckhannon River at Hall, W. Va., 1907–1909.
    - West Fork River at Enterprise, W. Va., 1907–1910.
    - Buffalo Creek at Barrackville, W. Va., 1907–8.
    - Cheat River at Morgantown, W. Va., 1899–1900; 1902–1905; 1908–9.
    - Youghiogheny River at Friendsville, Md., 1898–1904.
    - Youghiogheny River at Confluence, Pa., 1904–1909.
      - Casselman River at Confluence, Pa., 1904–1910.
      - Laurel Hill Creek at Confluence, Pa., 1904–1910.
      - Indian Creek in Westmoreland County, Pa., 1892–3.
  - Beaver River:
    - Mahoning River at Youngstown, Ohio, 1903–1906.
  - Cross Creek near Mingo Junction, Ohio, 1903.
  - McMahon River at Steel, Ohio, 1903.
  - Muskingum River at Zanesville, Ohio, 1905–1910.
    - Mohican River at Pomerene, Ohio, 1910.
    - Licking River at Pleasant Valley, Ohio, 1902–1906.
    - Jonathan Creek at Powells, Ohio, 1902–3.
  - New River, South Fork (head of New River, which in turn is head of Kanawha River) at New River, N. C., 1900–1901.
  - New River, South Fork, near Crumpler, N. C., 1908–1910.
  - New River at Oldtown, Va., 1900–1903.
  - New River near Grayson, Va., 1908–1910.
  - New River at Radford, Va., 1898–1910.
  - New River at Fayette, W. Va., 1895–1904; 1908–1910.
    - New River, North Fork, at Weaversford, N. C., 1900–1901.
    - New River, North Fork, near Crumpler, N. C., 1908–1910.

- Allegheny River—Continued.
  - New River—Continued.
    - Reed Creek at Grahams Forge, Va., 1908–1910.
    - Big Reed Island Creek near Allisonia, Va., 1908–1910.
    - Little River near Copper Valley, Va., 1908–1910.
    - Walker Creek at Staffordsville, Va., 1908–1910.
    - Wolf Creek near Narrows, Va., 1908–1910.
    - Bluestone River at Lilly, W. Va., 1908–1910.
    - Greenbrier River near Marlinton, W. Va., 1908–1910.
    - Greenbrier River at Alderson, W. Va., 1895; 1908–1910.
    - Gauley River at Allingdale, W. Va., 1908–1910.
    - Gauley River near Summersville, W. Va., 1908–1910.
    - Gauley River at Belva, W. Va., 1908–1910.
      - Cherry River at Richwood, W. Va., 1908–1910.
      - Meadow River near Russellville, W. Va., 1908–1910.
    - Elk River at Webster Springs, W. Va., 1908–1910.
    - Elk River at Gassaway, W. Va., 1908–1910.
    - Elk River at Clendennin, W. Va., 1908–1910.
    - Coal River at Brushton, W. Va., 1908–1910.
    - Coal River at Tornado, W. Va., 1908–1910.
    - Pocotaligo River at Sissonville, W. Va., 1908–1910.
  - Scioto River near Columbus, Ohio, 1898–1906.
    - Olentangy River near Columbus, Ohio, 1898–1905.
  - Little Miami River at Loveland, Ohio, 1906.
  - Little Miami River near Morrow, Ohio, 1903.
  - Miami River at Hamilton, Ohio, 1910.
  - Miami River at Dayton, Ohio, 1905–1910.
    - Mad River near Springfield, Ohio, 1904–1906.
  - Kentucky River at Frankfort, Ky., 1905–6.
    - Dix River near Danville, Ky., 1905.
    - Dix River near Burgin, Ky., 1910.
  - Salt River, Rolling Fork, at New Haven, Ky., 1905–6.
  - Wabash River at Logansport, Ind., 1903–1906.
  - Wabash River at La Fayette, Ind., 1901–1903.
  - Wabash River at Terre Haute, Ind., 1902–3 and 1905–6.
  - Wabash River at Mount Carmel, Ind., 1884–1910 (gage height records by United States Weather Bureau).
    - Tippecanoe River at Delphi, Ind., 1903–1906; 1908.
    - Embarrass River near Oakland, Ill., 1909–10.
    - Embarrass River at St. Marie, Ill., 1909–10.
    - White River, West Branch, at Indianapolis, Ind., 1904–1906.
      - Eel River at Cataract, Ind., 1903–1906.
      - White River, East Branch, at Shoals, Ind., 1903–1906; 1909–10.
    - Little Wabash River at Clay City, Ill., 1909–10.
    - Little Wabash River at Golden Gate, Ill., 1909–10.
    - Little Wabash River at Carmi, Ill., 1909–10.
      - Skillet Fork at Wayne City, Ill., 1909–10.
      - Skillet Fork at Mill Shoals, Ill., 1909–10.
  - Cumberland River at Nashville, Tenn., 1901–1904.
  - French Broad River (head of Tennessee River) at Rosman, N. C., 1907–1909.
  - French Broad River at Horseshoe, N. C., 1904–1906.
  - French Broad River at Asheville, N. C., 1895–1910.
  - French Broad River at Newport, Tenn., 1900–1905; 1907.
  - Tennessee River at Knoxville, Tenn., 1899–1910.

- Allegheny River—Continued.
  - Tennessee River at Chattanooga, Tenn., 1895–1910.
    - Davidson River near Davidson River, N. C., 1904–1909.
    - Little River at Calhoun, N. C., 1907–8.
    - Mills River, North Fork, at Pinkbed, N. C., 1904–1909.
      - Mills River, South Fork, near Sitton, N. C., 1904-1909.
    - Mud Creek at Naples, N. C., 1907.
    - Swannanoa River at Swannanoa, N. C., 1907–1909.
    - Swannanoa River at Biltmore, N. C., 1905.
    - Ivy River at Democrat, N. C., 1907.
    - Pigeon River at Canton, N. C., 1907–1909.
    - Pigeon River at Newport, Tenn., 1900–1909.
    - Nolichucky River at Chucky Valley, Tenn., 1900–1901.
    - Nolichucky River at Greeneville, Tenn., 1903–1908.
      - North Toe River at Spruce Pine, N. C., 1907–8.
    - Holston River, South Fork (head of Holston River), near Chilhowie, Va., 1907–1909.
    - Holston River, South Fork, at Bluff City, Tenn., 1900–1910.
    - Holston River near Rogersville, Tenn., 1904–1909.
      - Holston River, Middle Fork, at Chilhowie, Va., 1907–1910.
      - Watauga River at Butler, Tenn., 1900–1901.
      - Watauga River near Elizabethton, Tenn., 1903–1908.
        - Elk Creek at Lineback, Tenn., 1900–1901.
        - Roane Creek at Butler, Tenn., 1900–1901.
        - Doe River at Elizabethton, Tenn., 1907–8.
      - Holston River, North Fork, at Daltville, Va., 1907–8.
    - Little Tennessee River at Franklin, N. C., 1907–1910.
    - Little Tennessee River at Judson, N. C., 1896–1910.
    - Little Tennessee River at McGhee, Tenn., 1905–1910.
      - Cullasagee River at Cullasagee, N. C., 1907–1909.
    - Nantahala River near Nantahala, N. C., 1907–1909.
    - Tuckasegee River near East Laport, N. C., 1907–1909.
    - Tuckasegee River at Bryson, N. C., 1896–1910.
      - Scotts Creek near Dillsboro, N. C., 1907–8.
      - Oconalufty River near Cherokee, N. C., 1907–8.
      - Cheoah River at Millsaps, N. C., 1907–8.
    - Clinch River at Clinchport, Va., 1907–1909.
    - Hiwassee River near Hayesville, N. C., 1907–1909.
    - Hiwassee River at Murphy, N. C., 1896–1910.
    - Hiwassee River at Reliance, Tenn., 1900–1910.
    - Hiwassee River at Charlestown, Tenn., 1899–1901, 1903.
      - Tusquitee Creek near Hayesville, N. C., 1907–1909.
      - Valley River at Tomotla, N. C., 1904–1909.
      - Nottely River at Ranger, N. C., 1901–1905.
      - Toccoa River near Dial, Ga., 1907–8.
      - Toccoa River at Blueridge, Ga., 1899–1903.
      - Ocoee River at McCays (Copper Hill), Tenn., 1903–1910.
    - Elk Creek near Elkmont, Ala., 1904–1908.
    - Duck River at Columbia, Tenn., 1904–1908.

IV. ST. LAWRENCE RIVER BASIN.

LAKE SUPERIOR BASIN.

St. Louis River near Forbes, Minn., 1910.
St. Louis River near Cloquet, Minn., 1903.

- St. Louis River near Thompson, Minn., 1909–10.
  - Whiteface River at Meadowlands, Minn., 1909–10.
  - Cloquet River at Independence, Minn., 1909–10.
- Ontonagon River near Rockland, Mich., 1903.
- Dead River near Negaunee, Mich., 1902–3.
- Dead River at Forestville, Mich., 1898–1902.
- Carp River near Marquette, Mich., 1902–3.

LAKE MICHIGAN BASIN.

- Escanaba River near Escanaba, Mich., 1903–1910.
- Menomonee River near Iron Mountain, Mich., 1902–1910.
- Menomonee River at Lower Quinnesec Falls, Wis., 1898–9.
- Menomonee River at Koss, Mich., 1907–1909.
- Iron River at Riverton Mine, Mich., 1900–1905.
- Peshtigo River near Crivitz, Wis., 1906–1910.
- Peshtigo River at Crivitz, Wis., 1906.
- Oconto River near Gillett, Wis., 1906–1909.
- Oconto River at Stiles, Wis., 1906.
- Fox River at Omro, Wis., 1902–3.
- Fox River at Oshkosh, Wis., 1902.
- Fox River at Wrightston, Wis., 1902–3.
  - Wolf River at Keshena, Wis., 1907–1909.
  - Wolf River at White House Bridge, near Shawano, Wis., 1906–7.
  - Wolf River at Darrows Bridge, near Shawano, Wis., 1906.
  - Wolf River at Northport, Wis., 1905.
  - Wolf River at Winneconne, Wis., 1902–3.
    - Little Wolf River near Northport, Wis., 1907–1909.
  - Fond du Lac River, East Branch, at Fond du Lac, Wis., 1903.
  - Fond du Lac River, West Branch, at Fond du Lac, Wis., 1903.
- St. Joseph River at Mendon, Mich., 1902–1905.
- St. Joseph River at Buchanan, Mich., 1901–1906.
  - Fawn River at White Pigeon, Mich., 1903–4.
- Kalamazoo River near Allegan, Mich., 1901–1908.
  - Reed's Springs near Albion, Mich., 1904–1906.
- Muskegon River at Newayo, Mich., 1901–1906.
- Grand River at North Lansing, Mich., 1901–1906.
- Grand River at Grand Rapids, Mich., 1901–1910.
  - Red Cedar River at Agricultural College, Mich., 1902–3.
  - Crockery Creek at Slocums Grove, Mich., 1902–3.
- Manistee River near Sherman, Mich., 1903–1910.
- Boardman River at Traverse City, Mich., 1903.

LAKE HURON BASIN.

- Thunder Bay River near Alpena, Mich., 1902–1904, 1906–1908.
- Au Sable River at Bamfield, Mich., 1902–1910.
- Rifle River near Sterling, Mich., 1905–1908.
- Rifle River at Omer, Mich., 1902–3.
- Shiawassee River (head of Saginaw River):
  - Flint River at Flint, Mich., 1903–4.
  - Cass River at Frankenmuth, Mich., 1908–9.
  - Cass River at Bridgeport, Mich., 1908.
  - Tittabawassee River at Freeland, Mich., 1903–1910.

LAKE ERIE BASIN.

- Huron River at Dover, Mich., 1904.
- Huron River at Dexter, Mich., 1904–1910.

- Huron River at Geddes, Mich., 1904–1909.
- Huron River at French Landing, Mich., 1904–5.
- Huron River at Flat Rock, Mich., 1904–1910.
- St. Marys River at Fort Wayne, Ind., 1905–6.
- Maumee River near Sherwood, Ohio, 1903–1906.
- Maumee River near Waterville, Ohio, 1901.
  - St. Joseph River at Fort Wayne, Ind., 1905–6.
  - Tiffin River near Defiance, Ohio, 1903–1906.
  - Auglaize River near Defiance, Ohio, 1903.
    - Ottawa River at Lima, Ohio, 1902–3.
    - Blanchard River at Ottawa, Ohio, 1902–3.
- Sandusky River at Fremont, Ohio, 1898–1901.
- Black River near Elyria, Ohio, 1903–1906.
- Cuyahoga River at Independence, Ohio, 1903–1906.
- Cuyahoga River at Cleveland, Ohio, 1903.
- Cattaraugus Creek near Versailles, N. Y., 1910.

LAKE ONTARIO BASIN.

- Genesee River at St. Helena, N. Y., 1908–1910.
- Genesee River at Mount Morris, N. Y., 1903–1909.
- Genesee River at Jones Bridge, Mount Morris, N. Y., 1903–1906. 1908–1910.
- Genesee River at Rochester, N. Y., 1904–1910.
  - Canaseraga Creek near Dansville, N. Y., 1910.
    - Keshqua Creek near Sonyea, N. Y., 1910.
  - Hemlock Lake at Hemlock, N. Y., 1894–1902.
    - Canadice Lake Outlet near Hemlock, N. Y., 1903–1909.
    - Honeoye Creek at East Rush, N. Y., 1903–1906.
- Seneca River (head of Oswego River) at Baldwinsville, N. Y., 1898–1908.
- Oswego River above Minetto, N. Y., 1900–1903.
- Oswego River at Battle Island, N. Y., 1900–1906.
- Oswego River at Oswego, N. Y., 1897–1901.
  - Seneca Lake at Geneva, N. Y., 1905–6.
- Cayuga Lake at Ithaca, N. Y., 1905–1908.
  - Fall Creek, near Ithaca, N. Y., 1908–1910.
  - Skaneateles Lake at Skaneateles, N. Y., 1890–91.
  - Skaneateles Lake Outlet at Willow Glen, N. Y., 1892–1910.
  - Skaneateles Lake Outlet at Jordan, N. Y., 1890–1892.
  - Onondaga Lake Outlet at Long Branch, N. Y., 1904.
  - Fish Creek, East Branch, (through Oneida Lake, head of Oneida River) at Point Rock, N. Y., 1898–9.
  - Oneida River at Brewerton, N. Y., 1899.
  - Oneida River at Euclid, N. Y., 1902–1909.
  - Oneida Creek at Kenwood, N. Y., 1898–1900.
    - Fish Creek, West Branch, at McConnellsville, N. Y., 1898–1901
    - Chittenango Creek at Chittenango, N. Y., 1901–1906.
    - Chittenango Creek at Bridgeport, N. Y., 1898–1901.
- Salmon River near Pulaski, N. Y., 1901–1908 and 1910.
- Black River near Felts Mills, Watertown, N. Y., 1902–1909.
- Black River at Huntingtonville Dam, near Watertown, N. Y., 1897–1901
  - Moose River at Moose River, N. Y., 1900–1910.
  - Beaver River at Croghan, N. Y., 1901–1903.

ST. LAWRENCE RIVER TRIBUTARIES.

- Oswegatchie River near Ogdensburg, N. Y., 1903–1910.
- Raquette River at Raquette Falls, near Coreys, N. Y., 1908–1910.

- Raquette River at Piercefield, N. Y., 1908–1910.
- Raquette River at South Colton, N. Y., 1904.
- Raquette River at Massena Springs, N. Y., 1903–1910.
    - Bog River at Tupper Lake, N. Y., 1908–1910.
- St. Regis River near Brasher Center, N. Y., 1910.
- Richelieu River at Fort Montgomery, N. Y., 1875–1910.
    - Lake Champlain at Burlington, Vt., 1907–1909.
        - Missisquoi River at Richford, Vt., 1909–1910.
        - Missisquoi River at Swanton, Vt., 1903.
        - Lamoille River near Morrisville, Vt., 1909–10.
        - Lamoille River at West Milton, Vt., 1903.
        - Winooski River above Stevens Branch near Montpelier, Vt., 1909–10.
        - Winooski River at Montpelier, Vt., 1909–10.
        - Winooski River at Richmond, Vt., 1903–1907 and 1910.
            - Worcester Branch of Winooski River at Montpelier, Vt., 1909–10.
            - Dog River at Northfield, Vt., 1909–10.
        - Otter Creek at Middlebury, Vt., 1903–1907.
        - Poultney River at Fairhaven, Vt., 1908.
            - Mettawee River at Whitehall, N. Y., 1908.
        - Lake George Outlet at Ticonderoga, N. Y., 1904–5.
        - Boquet River at Willsboro, N. Y., 1904 and 1908.
        - Au Sable River near Au Sable Forks, N. Y., 1910.
        - Au Sable River at Keeseville, N. Y., 1904 and 1908.
        - Saranac River at Saranac Lake, N. Y., 1902–3.
        - Saranac River at Plattsburg, N. Y., 1903–1910.
        - Big Chazy River at Mooers, N. Y., 1908.
- St. Francis River:
    - Clyde River (tributary through Lake Memphremagog) at West Derby, Vt., 1909–10.

V. HUDSON BAY AND UPPER MISSISSIPPI RIVER BASINS.

HUDSON BAY BASIN.

- St. Mary River at United States Reclamation Service camp, near Babb, Mont., 1910.
- St. Mary River at Main, Mont., 1901–2.
- St. Mary River near Babb (formerly dam site), Mont., 1902–1910.
- St. Mary River near Cardston, Alberta, 1902–1910.
    - Swiftcurrent Creek near Babb (formerly Wetzel), Mont., 1902–1910.
    - Kennedy Creek near Babb (formerly Wetzel), Mont., 1903–1906.
- Ottertail River (head of Red River), near Fergus Falls, Minn., 1904–1910.
- Red River near Fergus Falls, Minn., 1909–10.
- Red River at Fargo, N. Dak., 1901–1910.
- Red River at Grand Forks, N. Dak., 1901–1910 (gage height record 1895–1901).
- Red River at Emerson, Manitoba, 1902.
    - Pelican River near Fergus Falls, Minn., 1909–10.
    - Sheyenne River at Haggart, N. Dak., 1902–1907.
        - Devils Lake near Devils Lake, N. Dak., 1901–1910.
    - Wild Rice River at Twin Valley, Minn., 1909–10.
    - Red Lake River at Thief River Falls, Minn., 1909–10.
    - Red Lake River at Crookston, Minn., 1901–10.
        - Thief River near Thief River Falls, Minn., 1909–10.
        - Clearwater River at Red Lake Falls, Minn., 1909–10.
    - Pembina River at Neche, N. Dak., 1903–1910.
    - Mouse River near Foxholm, N. Dak., 1904–1906.

Red River—Continued.
- Mouse River at Minot, N. Dak., 1903–1910.
  - Des Lacs River at Foxholm, N. Dak., 1904–1906.
- Rainy Lake at Rainier, Minn., 1910.
- Rainy River at International Falls, Minn., 1909–10.
  - Little Fork Rainy River at Little Fork, Minn., 1909–10.
  - Big Fork River at Big Falls, Minn., 1909–10.
  - Big Fork River near Laurel, Minn., 1909.
  - Black River near Loman, Minn., 1909.

UPPER MISSISSIPPI RIVER BASIN.

Mississippi River above Sandy River, Minn., 1895–1910.
Mississippi River near Fort Ripley, Minn., 1909–10.
Mississippi River near Sauk Rapids, Minn., 1903–1906.
Mississippi River at Anoka, Minn., 1905–1910.
Mississippi River at St. Paul, Minn., 1873–1901.
- Sandy River below Sandy Lake Reservoir, Minn., 1910.
- Pine River below Pine River Reservoir, Minn., 1910.
- Prairie River near Grand Rapids, Minn., 1909.
- Crow Wing River at Nimrod, Minn., 1910.
- Crow Wing River at Motley, Minn., 1909.
- Crow Wing River at Pillager, Minn., 1903 and 1909–10.
- Long Prairie River near Motley, Minn., 1909–10.
- Sauk River near St. Cloud, Minn., 1909–10.
- Crow River, North Fork, near Rockford, Minn., 1909–10.
- Crow River at Rockford, Minn., 1909–10.
- Crow River near Dayton, Minn., 1906.
  - Crow River, South Fork, near Rockford, Minn., 1909–10.
- Rum River at Onamia, Minn., 1909–10.
- Rum River at Cambridge, Minn., 1909–10.
- Rum River at St. Francis, Minn., 1903.
- Rum River near Anoka, Minn., 1905–1909.
- Minnesota River near Odessa, Minn., 1909–10.
- Minnesota River near Montevideo, Minn., 1909–10.
- Minnesota River near Mankato, Minn., 1903–1910.
  - Whetstone River near Big Stone, S. Dak., 1910.
  - Lac qui Parle River at Lac qui Parle, Minn., 1910.
  - Chippewa River near Watson, Minn., 1909–10.
  - Redwood River near Redwood Falls, Minn., 1909–10.
  - Cottonwood River near New Ulm, Minn., 1909–10.
  - Blue Earth River at Rapidan Mills, Minn., 1909–10.
- St. Croix River:
  - Kettle River near Sandstone, Minn., 1909–10.
  - Snake River at Mora, Minn., 1909–10.
- Cannon River at Welch, Minn., 1909–10.
- Chippewa River at Chippewa Falls, Wis., 1899–1910.
- Chippewa River near Eau Claire, Wis., 1902–1910.
  - Flambeau River near Ladysmith, Wis., 1903–1906.
  - Red Cedar River at Cedar Falls, Wis., 1907–1910.
  - Red Cedar River at Menominee, Wis., 1907–8.
- Zumbro River at Zumbro Falls, Minn., 1909–10.
- Black River at Neillsville, Wis., 1905–1910.
- Black River at Melrose, Wis., 1902–3.
- Root River near Houston, Minn., 1909–1910.
  - Root River, North Branch, near Lanesboro, Minn., 1910.

Mississippi River—Continued.
- Wisconsin River near Rhinelander, Wis., 1905–1910.
- Wisconsin River at Merrill, Wis., 1902–1910.
- Wisconsin River near Necedah, Wis., 1902–1910.
- Wisconsin River at Muscoda, Wis., 1902–3.
- Maquoketa River at Manchester Iowa, 1903.
- Wapsipinicon River at Stone City, Iowa, 1903–1910.
- Rock River above mouth of Pecatonica River at Rockton, Ill., 1903.
- Rock River below mouth of Pecatonica River at Rockton, Ill., 1903–1910.
- Rock River near Nelson, Ill., 1906.
- Rock River at Sterling, Ill., 1905–6.
  - Catfish River at Madison, Wis., 1902–3.
  - Lake Mendota at Madison, Wis., 1902–3.
- Iowa River at Marshalltown, Iowa, 1903.
- Iowa River at Iowa City, Iowa, 1903–1906.
  - Cedar River near Austin, Minn., 1909–10.
  - Red Cedar River at Janesville, Iowa, 1905–6.
  - Cedar River at Cedar Rapids, Iowa, 1903–1910.
- Des Moines River at Jackson, Minn., 1910.
- Des Moines River at Fort Dodge, Iowa, 1905–6.
- Des Moines River at Des Moines, Iowa, 1902–3, 1905–6.
- Des Moines River at Keosauqua, Iowa, 1903–1906.
  - Raccoon River near Des Moines, Iowa, 1902–3.
- Illinois River near Minooka, Ill., 1903–4.
- Illinois River near Seneca, Ill., 1903.
- Illinois River near Ottawa, Ill., 1903–4.
- Illinois River near La Salle, Ill., 1903.
- Illinois River near Peoria, Ill., 1903–1906.
  - Kankakee River at Davis, Ind., 1905–6.
  - Kankakee River at Momence, Ill., 1905–6.
    - Yellow River at Knox, Ind., 1905–6.
  - Desplaines River above mouth of Jackson Creek near Channahon, Ill., 1903–1906.
  - Desplaines River above Kankakee River, near Channahon, Ill., 1902–3.
- Fox River at Sheridan, Ill., 1905–6.
- Fox River at Ottawa, Ill., 1903.
  - Sangamon River at Monticello, Ill., 1908 and 1910.
  - Sangamon River at Decatur, Ill., 1905.
  - Sangamon River at Riverton, Ill., 1908–1910.
  - Sangamon River near Springfield, Ill., 1903.
  - Sangamon River near Oakford, Ill., 1909–10.
  - Sangamon River near Chandlerville, Ill., 1908.
    - Sangamon River, South Fork, near Taylorville, Ill., 1908–1910.
    - Salt Creek near Kenny, Ill., 1908–1910.
- Cahokia Creek at Poag, Ill., 1909–10.
- Kaskaskia River near Arcola, Ill., 1908–1910.
- Kaskaskia River at Shelbyville, Ill., 1908–1910.
- Kaskaskia River at Vandalia, Ill., 1908–1910.
- Kaskaskia River at Carlysle, Ill., 1908–1910.
- Kaskaskia River at New Athens, Ill., 1909–10.
  - Shoal Creek near Breese, Ill., 1909–10.
  - Silver Creek near Lebanon, Ill., 1908–1910.
- Big Muddy River near Cambon, Ill., 1908–1910.
- Beaucoup Creek near Pinckneyville, Ill., 1908–1910.

VI. MISSOURI RIVER BASIN.

- Red Rock River (head of Missouri) at Lima, Mont., 1907–1910.
- Red Rock River at Red Rock, Mont., 1890.
- Beaverhead River (continuation of Red Rock River) at Barratts, Mont., 1907–1910.
- Beaverhead River at Dillon, Mont., 1907.
- Jefferson River (continuation of Red Rock-Beaverhead River) near Sappinton, Mont., 1896–1905.
- Jefferson River near Silverstar, Mont., 1910.
- Missouri River near Townsend, Mont., 1895–1904.
- Missouri River at Canyon Ferry, Mont., 1889.
- Missouri River near Craig, Mont., 1890–1902.
- Missouri River at Cascade, Mont., 1902–1910.
- Missouri River at Great Falls, Mont., 1897–1905.
- Missouri River at Fort Benton, Mont., 1910.
- Missouri River near Williston, N. Dak., 1905–1907.
- Missouri River at Mannhaven, N. Dak., 1904.
- Missouri River at Washburn, N. Dak., 1905.
- Missouri River near Bismarck, N. Dak., 1904–5.
- Missouri River at Kansas City, Mo., 1905–6.
  - Bighole River near Dewey, Mont., 1910.
  - Pipestone Creek near Whitehall, Mont., 1910.
  - Whitetail Creek near Whitehall, Mont., 1910.
  - Madison River near Red Bluff, Mont., 1890–1893.
  - Madison River near Norris, Mont., 1897–1905, 1910.
  - Madison River near Three Forks, Mont., 1895–1897.
  - West Gallatin River (head of Gallatin River) near Salesville, Mont., 1895–1905, 1910.
  - West Gallatin River near Bozeman, Mont., 1889–1893.
  - Gallatin River at Logan, Mont., 1895–1905.
    - Middle Creek near Bozeman, Mont., 1895–6, 1898–1900, 1901.
  - Crow Creek near Radersburg, Mont., 1903.
  - Prickly Pear Creek near Clancy, Mont., 1908–1910.
  - Prickly Pear Creek at East Helena, Mont., 1908–1910.
    - Lump Gulch Creek at Clancy, Mont., 1908–1910.
    - Tenmile Creek near Helena, Mont., 1908–1910.
    - Sevenmile Creek near Birdseye, Mont., 1908–1910.
  - Little Prickly Pear Creek near Marysville, Mont., 1909–10.
  - Little Prickly Pear Creek near Canyon Creek, Mont., 1909–10.
    - Deadman Creek near Marysville, Mont., 1909–10.
      - Lost Horse Creek near Marysville, Mont., 1909–10.
    - Marsh Creek near Marysville, Mont., 1909–10.
  - Dearborn River near Clemons, Mont., 1908–1910.
    - Falls Creek near Clemons, Mont., 1908–1910.
  - Smith River at Truly, Mont., 1905–1907.
  - Sun River, North Fork, near Augusta, Mont., 1899–90, 1903–1910.
  - Sun River at Sun River, Mont., 1905–1910.
  - Sun River near Great Falls, Mont., 1897.
    - Willow Creek near Augusta, Mont., 1905–1910.
    - Sun River, South Fork, at Augusta, Mont., 1904–1910.
      - Ford Creek near Augusta, Mont., 1906–1910.
      - Smith Creek near Augusta, Mont., 1906–1910.
  - Belt Creek near Belt, Mont., 1905–6.
  - Highwood Creek near Highwood, Mont., 1905–6.

Missouri River—Continued.
- Marias River near Shelby, Mont., 1902–1907.
    - Two Medicine River near Midvale, Mont., 1902–3.
    - Two Medicine River at Family, Mont., 1907–1910.
        - Badger Creek near Family, Mont., 1907–1910.
    - Cutbank Creek at Cutbank, Mont., 1905–1910.
    - Birch Creek near Dupuyer, Mont., 1907–1910.
        - Dupuyer Creek at Dupuyer, Mont., 1908–1910.
    - Teton River at Chouteau, Mont., 1905–6.
    - Teton River near Belleview (Strabone), Mont., 1905–6 and 1908–1910.
- Judith River near Lewistown, Mont., 1910.
- Musselshell River, North Fork (head of Musselshell River), near Delpine, Mont., 1909–10.
- Musselshell River, North Fork, near Martinsdale, Mont., 1907–1910.
- Musselshell River at Harlowton, Mont., 1907–1910.
- Musselshell River at Shawmut, Mont., 1902–1907.
- Musselshell River at Lavina, Mont., 1906.
    - Checkerboard Creek near Delpine, Mont., 1909–10.
    - Musselshell River, South Fork, near Martinsburg, Mont., 1907–1910.
    - American Fork near Harlowton, Mont., 1907–1910.
        - Lebo Creek near Harlowton, Mont., 1907–1910.
- Milk River, South Fork (head of Milk River), near Browning, Mont., 1905–1910.
- Milk River at Havre, Mont., 1908–1910.
- Milk River at Chinook, Mont., 1897.
- Milk River at Malta, Mont., 1902–1910.
- Milk River at Hinsdale, Mont., 1908–1910.
    - Milk River, West Fork, at Chinook, Mont., 1906–1909.
    - Milk River, North Fork, near Chinook, Mont., 1906–1910.
    - Beaver Creek near Saco (Ashfield), Mont., 1903–1906 and 1908–1910.
    - Beaver Creek overflow near Bowdoin, Mont., 1903–1906 and 1908–1910.
    - Rock Creek near Hinsdale, Mont., 1905–1907.
    - Porcupine Creek near Nashua, Mont., 1908–1910.

CANALS IN THE MILK RIVER BASIN.

- Paradise Valley canal near Chinook, Mont., 1903–1909.
- Cook canal near Chinook, Mont., 1905–1910.
- Matheson canal near Chinook, Mont., 1905–6 and 1908–1910.
- Reser ditch near Chinook, Mont., 1905–6.
- West Fork ditch near Chinook, Mont., 1905–6.
- Harlem canal near Zurich, Mont., 1904–1906 and 1908–1910.
- Agency ditch near Harlem, Mont., 1905–1910.
- Fort Belknap canal near Chinook, Mont., 1903–1910.
- Winter Anderson canal near Chinook, Mont., 1906 and 1908..
- Rock Creek canal near Hinsdale, Mont., 1905–1907.

- Little Porcupine Creek near Frazer, Mont., 1908–1910.
- Wolf Creek at Wolf Point, Mont., 1908–1910.
- Wolf Point ditch at Wolf Point, Mont., 1909–10.
- Poplar Creek near Poplar, Mont., 1908–1910.
- Big Muddy River near Culbertson, Mont., 1908–1910.
- Yellowstone River at Corwin Springs, Mont., 1910.
- Yellowstone River near Horr, Mont., 1888–1893.
- Yellowstone River at Livingston, Mont., 1897–1905.
- Yellowstone River at Billings, Mont., 1904–5.
- Yellowstone River at Huntley, Mont., 1907–1910.

- Missouri River—Continued.
    - Yellowstone River at Junction, Mont., 1906–7.
    - Yellowstone River at Glendive, Mont., 1897–1910.
        - Big Timber Creek, North Fork, near Big Timber, Mont., 1907–1910.
        - Big Timber Creek, South Fork, near Big Timber, Mont., 1907–1910.
        - Boulder River near Contact, Mont., 1910.
            - Boulder River, East Fork, near McLeod, Mont., 1907–1909.
            - Boulder River, West Fork, near Bruffeys, Mont., 1907–1910.
            - Boulder River, West Fork, near McLeod, Mont., 1907–1910.
        - Sweetgrass Creek above Melville, Mont., 1907–1910.
        - Sweetgrass Creek below Melville, Mont., 1907–1910.
        - Stillwater River near Absarokee, Mont., 1910.
            - Rosebud Creek at Absarokee, Mont., 1910.
        - Clark Fork at Fromberg, Mont., 1906–1910.
        - Pryor Creek near Huntley, Mont., 1904–1910.
        - Big Wind River (head of Bighorn) near Wind River, Wyo., 1908–9.
        - Big Wind River near Riverton, Wyo., 1906–1908.
        - Bighorn River at Thermopolis, Wyo., 1900–1905 and 1910.
        - Bighorn River near Hardin, Mont., 1904–1910.
            - Red River near Dubois, Wyo., 1909.
            - Dinwoody Creek near Crowheart, Wyo., 1909.
            - Dry Creek at Crowheart, Wyo., 1909.
            - Meadow Creek near J. K. ranch, Wyo., 1909.
            - Willow Creek at J. K. ranch, Wyo., 1909.
            - Bull Lake Creek near J. K. ranch, Wyo., 1909.
            - Little Wind River at Fort Washakie, Wyo., 1908–9.
            - Little Wind River above Arapahoe Agency, Wyo., 1906–1909.
            - Little Wind River below Arapahoe Agency, Wyo., 1906–1909.
                - Little Wind River, South Fork, near Wind River, Wyo., 1909.
                - St. Lawrence Creek near Wind River, Wyo., 1909.
                - Trout Creek at Wind River, Wyo., 1909.
                - Little Popo Agie River at Hudson, Wyo., 1907–1909.
            - Owl Creek near Thermopolis, Wyo., 1910.
            - No Wood River at Bonanza, Wyo., 1910.
                - Ten Sleep Creek near Ten Sleep, Wyo., 1910.
                - Paint Rock Creek near Bonanza, Wyo., 1910.
            - Grey Bull River near Meeteetse, Wyo., 1897, 1903, 1910.
                - Wood River near Meeteetse, Wyo., 1910.
            - Shoshone River at Cody, Wyo., 1902–1910.
            - Shoshone River at Corbett Dam, Wyo., 1908–1910.
            - Shoshone River near Lovell, Wyo., 1897–1899.
                - Shoshone River, South Fork, at Marquette, Wyo., 1903–1908.
            - Little Bighorn River at Crow Agency, Mont., 1905–6.
                - Prairie Dog ditch near Story, Wyo., 1903.
        - Tongue River near Dayton, Wyo., 1903.
            - Big Goose Creek near Sheridan, Wyo., 1895–1897.
                - Little Goose Creek near Sheridan, Wyo., 1896–97.
        - Powder River:
            - Clear Creek at Buffalo, Wyo., 1896–1904.
                - Piney Creek at Kearney, Wyo., 1902–1906.
                    - Cruez ditch near Story, Wyo., 1903.
    - Little Muddy River near Williston, N. Dak., 1904–1909.
    - Little Missouri River at Alzada, Mont., 1904–1906.
    - Little Missouri River at Camp Crook, S. Dak., 1903–1906.

- Missouri River—Continued.
  - Little Missouri River at Medora, N. Dak., 1903–1908.
  - Knife River near Broncho, N. Dak., 1903–1910.
  - Painted Woods Creek near Washburn, N. Dak., 1909–10.
    - Turtle Creek near Washburn, N. Dak., 1909–10.
  - Heart River near Richardton, N. Dak., 1903–1910.
  - Apple Creek near Bismarck, N. Dak., 1905.
  - Cannon Ball River at Stevenson, N. Dak., 1903–1909.
  - Grand River, North Fork, at Haley, N. Dak., 1908–1910.
  - Grand River near Seim, S. Dak., 1904–1906.
  - Owl (Moreau) River near Bixby, S. Dak., 1904–1906.
  - Cheyenne River at Edgemont, S. Dak., 1903–1906.
    - Beaver Creek near Edgemont, S. Dak., 1905–6.
    - Hat Creek near Edgemont, S. Dak., 1905–6.
    - Battle Creek near Hermosa, S. Dak., 1903.
    - Spring Creek near Rapid, S. Dak., 1903–1906.
    - Rapid Creek at Rapid, S. Dak., 1903–1906.
    - Box Elder Creek at Blackhawk, S. Dak., 1903–1905.
      - Corbin-Morse ditch at Rapid, S. Dak., 1906.
    - Elk Creek near Piedmont, S. Dak., 1903.
    - Belle Fourche River at Bellefourche, S. Dak., 1903–1906.
    - Belle Fourche River near Bellefourche, S. Dak., 1906.
      - Redwater River at Bellefourche, S. Dak., 1903–1906.
      - Redwater River near Minneséla, S. Dak., 1903.
        - Redwater Canal at Minneséla, S. Dak., 1904–1906.
        - Spearfish Creek near Spearfish, S. Dak., 1903–1906.
        - Crow Creek near Bellefourche, S. Dak., 1904.
        - Owl Creek near Bellefourche, S. Dak., 1904.
        - Indian Creek near Bellefourche, S. Dak., 1904.
  - White River at Interior, S. Dak., 1904–1906.
  - Niobrara River near Valentine (Fort Niobrara), Nebr., 1897, 1899, 1901–1906.
  - Niobrara River near Spencer, Nebr., 1908.
  - Niobrara River near Niobrara, Nebr., 1902, 1910.
    - Red Deer Lake (head of Plum Creek) near Woodlake, Nebr., 1904–5.
  - James River near Lamoure, N. Dak., 1903.
  - Big Sioux River near Watertown, S. Dak., 1900–1903.
  - Big Sioux River near Sioux Falls, S. Dak., 1900–1901.
    - Grizzly Creek at Hebron, Colo., 1904–5.
  - North Platte River (head of Platte River) near Hebron, Colo., 1904–5.
  - North Platte River near Cowdrey, Colo., 1904–5.
  - North Platte River near Pinkhampton, Colo., 1904.
  - North Platte River at Saratoga, Wyo., 1903–1906, 1909.
  - North Platte River at Pathfinder, Wyo., 1905–1910.
  - North Platte River at Alcova, Wyo., 1904–5.
  - North Platte River near Douglas, Wyo., 1894.
  - North Platte River near Orin Junction, Wyo., 1895–1900.
  - North Platte River near Fort Laramie, Wyo., 1887–1889.
  - North Platte River at Guernsey, Wyo., 1900–1908.
  - North Platte River at Whalen, Wyo., 1909.
  - North Platte River and Interstate Canal at Whalen, Wyo., 1910.
  - North Platte River near Mitchell, Nebr., 1901–1910.
  - North Platte River near Gering, Nebr., 1897–1900.
  - North Platte River near Camp Clark, Nebr., 1896–1900.
  - North Platte River at Bridgeport, Nebr., 1902–1906.

- Missouri River—Continued.
  - North Platte River at North Platte, Nebr., 1894–1910.
  - Platte River near Lexington, Nebr., 1902–1906.
  - Platte River at Columbus, Nebr., 1895–1910.
  - Platte River near South Bend, Nebr., 1903.
    - Little Grizzly Creek at Hebron, Colo., 1904–5.
    - North Platte, Roaring Fork, near Hebron, Colo., 1904–5.
    - North Platte, North Fork, at Higho, Colo., 1904–5.
    - Michigan Creek near Walden, Colo., 1904–5.
    - Michigan Creek near Cowdrey, Colo., 1904–5.
    - Canadian River at Cowdrey, Colo., 1904–5.
    - Grand Encampment Creek near Peryam's ranch, Wyo., 1900.
    - Medicine Bow River near Medicine Bow, Wyo., 1901.
    - Sweetwater River near Splitrock, Wyo., 1902–3.
    - Laramie River at Glendevey, Colo., 1904–5, 1910.
    - Laramie River near Jelm, Wyo., 1904–5.
    - Laramie River near Woods Landing, Wyo., 1895–1900.
    - Laramie River near Uva, Wyo., 1895–1900, 1903.
      - McIntyre Creek near Gleneyre, Colo., 1904–5.
      - Little Laramie River near Hatton, Wyo., 1902–3.
      - Little Laramie River near Laramie, Wyo., 1903.
    - South Platte, South Fork (head of South Platte), near Cheeseman Lake, Colo., 1899–1901.
    - South Platte, South Fork, at Fairplay, Colo., 1910.
    - South Platte, South Fork, at Lake George, Colo., 1910.
    - South Platte, South Fork, at South Platte, Colo., 1905–1910.
    - South Platte River at South Platte, Colo., 1902–1910.
    - South Platte River near Deansbury (Platte Canyon), Colo., 1887–1892, 1895–1900.
    - South Platte River at Denver, Colo., 1895–1906, 1909–10.
    - South Platte River near Kersey, Colo., 1901–1903, 1905–1910.
    - South Platte River near Orchard, Colo., 1895–1900.
    - South Platte River near Julesburg, Colo., 1902–1906, 1908–1910.
    - South Platte River near Big Spring, Nebr., 1902–3.
      - Tarryall Creek near Jefferson, Colo., 1910.
      - Tarryall Creek near Hayman, Colo., 1910.
      - Jefferson Creek near Jefferson, Colo., 1910
        - Michigan Creek near Jefferson, Colo., 1910.
      - Goose Creek near Cheeseman Lake, Colo., 1899.
      - South Platte River, North Fork, at Grant, Colo., 1910.
      - South Platte River, North Fork, at Cassells, Colo., 1908–1910.
      - South Platte River, North Fork, at South Platte, Colo., 1909–10.
        - Geneva Creek above Jackwhacker Creek, near Grant, Colo., 1909–10.
        - Geneva Creek at Old Geneva smelter, near Grant, Colo., 1909–10.
        - Geneva Creek at Sullivan's ranch, near Grant, Colo., 1908–1910.
        - Smelter Creek at Old Geneva smelter, near Grant, Colo., 1909–10.
        - Duck Lake Creek near Grant, Colo., 1909–10.
        - Scott Gomer Creek at Geneva Power Co.'s dam site, Colo., 1909.
        - Scott Gomer Creek at Sullivan's ranch, near Grant, Colo., 1909–10.
      - Bear Creek near Morrison, Colo., 1888–1891, 1895–1902.
      - Clear Creek at Forkscreek, Colo., 1899–1910.
      - Clear Creek at Idaho Springs, Colo., 1910.
      - Clear Creek at Golden, Colo., 1897–98 and 1909.

- Missouri River—Continued.
  - Platte River—Continued.
    - South Platte River—Continued.
      - St. Vrain Creek near Lyons, Colo., 1888–1892, 1895–1903, 1909.
        - Boulder Creek at Orodell, Colo., 1907–8, 1910.
        - Boulder Creek near Boulder, Colo., 1888–1892, 1895–1901, 1907–1909.
          - North Boulder Creek near Boulder, Colo., 1887–1890.
          - South Boulder Creek near Marshall, Colo., 1888–1892, 1895–1901, and 1909.
            - Community canal near Marshall, Colo., 1909.
      - Big Thompson Creek near Arkins, Colo., 1888–1890, 1895–1903, 1909.
      - Big Thompson Creek near Loveland, Colo., 1888–1890.
        - Handy ditch near Arkins, Colo., 1899–1900, 1903.
      - Cache la Poudre River near Elkhorn, Colo., 1909–10.
      - Cache la Poudre River near Fort Collins, Colo., 1909–10.
      - Cache la Poudre River at mouth of canyon near Fort Collins, Colo., 1884–1901, 1910.
      - Cache la Poudre River near Greeley, Colo., 1903.
      - Middle Crow Creek near Hecla, Wyo., 1902–3.
    - Loup River at Columbus, Nebr., 1894–1910.
      - Middle Loup River near St. Paul, Nebr., 1895, 1897, 1899, 1903.
      - North Loup River near St. Paul, Nebr., 1895, 1897, 1899, 1903.
    - Elkhorn River near Norfolk, Nebr., 1896–1903.
    - Elkhorn River near Arlington, Nebr., 1898–1903.
    - Elkhorn River, South Fork, near Norfolk, Nebr., 1896.
  - Republican River, North Fork (head of Kansas River), near Benkleman, Nebr., 1895.
  - Republican River at Benkleman, Nebr., 1903–1906.
  - Republican River at Bostwick, Nebr., 1904–1910.
  - Republican River near Superior, Nebr., 1896–1903.
  - Republican River at Junction, Kans., 1895–1905.
  - Kansas River near St. George, Kans., 1904.
  - Kansas River near Topeka, Kans., 1904.
  - Kansas River near Lecompton, Kans., 1899–1901, 1903–1906.
  - Kansas River near Lawrence, Kans., 1895–1899.
    - Republican River, South Fork, at Benkleman, Nebr., 1895, 1903–1906.
    - Frenchman River near Wauneta, Nebr., 1895.
    - Frenchman River near Palisade, Nebr., 1895–6.
    - Smoky Hill River at Ellsworth, Kans., 1895–1902, 1904–5.
    - Smoky Hill River at Solomon, Kans., 1902–1904.
      - Beaver (Ladder) Creek near Scott City, Kans., 1904–5.
      - Saline River near Salina, Kans., 1895–1903.
      - Solomon River near Niles, Kans., 1895–1903.
    - Big Blue River (head of Blue River) at Beatrice, Nebr., 1910.
    - Blue River at Manhattan, Kans., 1895–1905.
      - Little Blue River near Fairbury, Nebr., 1908–1910.
  - Osage River at Ottawa, Kans., 1902–1905.
  - Gasconade River at Arlington, Mo., 1903–1906.
    - Gasconade River, Piney Fork, near Houston, Mo., 1908.
    - Gasconade River, Piney Fork, near Hooker, Mo., 1903. (Also called Big Piney Creek.)
    - Little Piney Creek near Arlington, Mo., 1903.

VII. LOWER MISSISSIPPI RIVER BASIN.

MERAMEC RIVER BASIN.

Meramec River near Meramec, Mo., 1903–1906.
Meramec River near Eureka, Mo., 1903–1906.
Meramec River (Station No. 1) at Fenton, Mo., 1903.
Meramec River (Station No. 2) below Fenton, Mo., 1903.
  Meramec Spring near Meramec, Mo., 1903–1906.
  Courtois Creek at Scotia, Mo., 1905–6.

WHITE RIVER BASIN.

White River at Beaver, Ark., 1909–10.
White River near Branson, Mo., 1909–10.
White River near Lead Hill, Ark., 1909–10.
White River near Cotter, Ark., 1909–10.
White River at Walls Ferry, Ark., 1909–10.
  Buffalo River near Gilbert, Ark., 1909–10.
  North Fork River near Henderson, Ark., 1909–10.
  Greer Spring at Greer, Mo., 1904.
  Little Red River near Pangburn, Ark., 1909–10.

ARKANSAS RIVER BASIN.

Arkansas River, East Fork (head of Arkansas), near Leadville, Colo., 1890, 1903.
Arkansas River at Granite, Colo., 1895, 1897–1899, 1901, 1910.
Arkansas River at Salida, Colo., 1895–1903, 1909–10.
Arkansas River at Canon City, Colo., 1888–1910.
Arkansas River near Rock Canyon, Colo., 1889.
Arkansas River above Pueblo, Colo., 1885–1887.
Arkansas River at Pueblo, Colo., 1894–1910.
Arkansas River near Nepesta, Colo., 1897–1903, 1910.
Arkansas River near Manzanola, Colo., 1898.
Arkansas River near Rocky Ford, Colo., 1897–1903.
Arkansas River at La Junta, Colo., 1889, 1893–1895, 1903, 1908.
Arkansas River near Las Animas, Colo., 1898.
Arkansas River near Prowers, Colo., 1900, 1901, 1903.
Arkansas River near Amity canal head-gates, Colo., 1898–99.
Arkansas River near Granada, 1898–1901, 1904.
Arkansas River near Barton (Byron), Colo., 1893–94, 1901–2.
Arkansas River at Holly, Colo., 1907–1910.
Arkansas River near Syracuse, Kans., 1903–1906.
Arkansas River near Coolidge, Kans., 1903.
Arkansas River near Dodge, Kans., 1902–1906.
Arkansas River near Hutchinson, Kans., 1895–1905.
Arkansas River near Arkansas City, Kans., 1902–1906.
  Arkansas River, Tennessee Fork, near Leadville, Colo., 1890, 1903.
  Arkansas River, Lake Fork, near Arkansas Junction, Colo., 1903.
  Arkansas River, Lake Fork, near Leadville, Colo., 1890.
  Lake Creek near Twin Lakes, Colo., 1899–1900.
  Twin Lakes outlet near Twin Lakes, Colo., 1910.
  Clear Creek near Granite, Colo., 1890, 1910.
  Cottonwood Creek near Buena Vista, Colo., 1910.
  Cottonwood Creek, Middle Fork, near Buena Vista, Colo., 1890.
  Cottonwood Creek, South Fork, near Buena Vista, Colo., 1890.
  Chalk Creek near Buena Vista, Colo., 1910.

- **Arkansas** River—Continued.
  - Grape Creek near Canon City, Colo., 1907–1909.
  - Oil or Fourmile Creek near Canon City, Colo., 1910.
  - Huerfano River near Undercliffe, Colo., 1908.
    - Cucharas River at Walsenburg, Colo., 1907–8.
  - Purgatory River at Trinidad, Colo., 1896–1899, 1905–1910.
  - Purgatory River near canyon entrance (Alfalfa), Colo., 1905–1907.
  - Purgatory River near J. J. ranch, Colo., 1898.
  - Purgatory River near Las Animas, Colo., 1889.
  - Big Sandy Creek at Hugo, Colo., 1910.
  - Big Sandy Creek at Kit Carson, Colo., 1910.
    - Big Spring Creek near Arena, Colo., 1910.
  - Walnut River near Arkansas City, Kans., 1902–3.
  - Arkansas River, Salt Fork, near Alva, Okla., 1904–5.
  - Arkansas River, Salt Fork, near Tonkawa, Okla., 1903–1905.
    - Medicine River near Kiowa, Kans., 1895–96.
  - Cimarron River near Arkalon, Kans., 1895–96, 1903–1905.
  - Cimarron River near Kenton, Okla., 1904–5.
  - Cimarron River near Garrett, Okla., 1905–1907.
  - Cimarron River near Waynoka, Okla., 1903–1905.
  - Verdigris River near Independence, Kans., 1904.
  - Verdigris River near Liberty, Kans., 1895–1903.
  - Verdigris River near Catoosa, Okla., 1903–1905.
    - Fall River near Fall River, Kans., 1904–5.
  - Neosho River near Neosho Rapids, Kans., 1904.
  - Neosho River near Iola, Kans., 1895–1903.
  - Neosho River near Humboldt, Kans., 1904.
  - Neosho River (or Grand River) near Fort Gibson, Okla., 1899, 1903–1905.
  - Canadian River near Logan, N. Mex., 1905, 1909–10.
  - Canadian River at Calvin, Okla., 1904–1908.
    - Chico Rico Creek near Raton, N. Mex., 1910.
    - Una del Gato Creek near Raton, N. Mex., 1910.
    - Cimarron River at Ute Park, N. Mex., 1907–1910.
    - Cimarron River at Springer, N. Mex., 1907–1909.
      - Rayado River at Abren's ranch, near Cimarron, N. Mex., 1909–10.
      - Rayado River near Springer, N. Mex., 1907–1909.
    - Mora River and La Cueva canal at La Cueva, N. Mex., 1903–1910.
    - Mora River near Weber, N. Mex., 1903–4.
    - Mora River near Watrous, N. Mex., 1894–1896.
      - Sapello River at Sapello, N. Mex., 1903–4.
      - Sapello Mill tailrace at Sapello, N. Mex., 1903–4.
      - Sapello River at Los Alamos, N. Mex., 1903–1910.
        - Manuelitos River near Sapello, N. Mex., 1903–4.
      - Ute Creek near Logan, N. Mex., 1904–1906, 1909–10.
      - Beaver Creek at Beaver, Okla., 1904–5.
      - Canadian River, North Fork, near Woodward, Okla., 1903–1906.
      - Canadian River, North Fork, near El Reno, Okla., 1902–1908.
      - Canadian River, North Fork, near Oklahoma, Okla., 1899.
      - Canadian River, North Fork, near Eufaula, Okla., 1899.
      - Arkansas River canals:
        - Oxford Farmers canal near Nepesta, Colo., 1903.
        - Colorado-Kansas canal near Prowers, Colo., 1903.
        - Keese ditch near Prowers, Colo., 1903.

YAZOO RIVER BASIN.

- Tallahatchie River at Batesville, Miss., 1906–1910.
- Tallahatchie River at Philipp, Miss., 1908–1910.
- Yazoo River at Greenwood, Miss., 1908–1910.
- Yazoo River at Yazoo City, Miss., 1900–1905.
  - Coldwater River at Savage, Miss., 1908–1910.
  - Yalobusha River at Grenada, Miss., 1906, 1908–1910.
  - Sunflower River at Ruleville, Miss., 1908–1910.
  - Sunflower River at Baird, Miss., 1908–1910.

HOMOCHITTO RIVER BASIN.

- Homochitto River at Rosetta, Miss., 1906.

RED RIVER BASIN.

- Red River at Arthur City, Tex., 1905–6.
  - Red River, Salt Fork, at Mangum, Okla., 1905–6.
    - Turkey Creek at Olustee, Okla., 1905–1908.
  - Red River, North Fork, near Granite, Okla., 1903–1908.
  - Red River, North Fork, near Snyder, Okla., 1905.
  - Red River, North Fork, near Headrick, Okla., 1905–1908.
    - Red River, Elm Fork, near Mangum, Okla., 1905–1908.
    - Elk Creek near Hobart, Okla., 1904–1908.
      - Otter Creek near Mountain Park, Okla., 1903–1908.
        - Horse Creek near Mountain Park, Okla., 1905–6.
        - Otter Creek, Dry Fork, near Mountain Park, Okla., 1905–6.
  - Wichita River at Wichita Falls, Tex., 1910.
  - Washita River near Anadarko, Okla., 1902–1908.
  - Ouachita River near Malvern, Ark., 1903–1905.
  - Ouachita River near Arkadelphia, Ark., 1905–6.

VIII. WESTERN GULF OF MEXICO BASINS.

SABINE RIVER BASIN.

- Sabine River near Longview, Tex., 1904–1906.
- Sabine River at Logansport, La., 1903–1906.
  - Neches River at Evadale, Tex., 1904–1906.

TRINITY RIVER BASIN.

- Trinity River at Dallas, Tex., 1903–1906.
- Trinity River at Riverside, Tex., 1903–1906.

BRAZOS RIVER BASIN.

- Brazos River at Waco, Tex., 1898–1910.
- Brazos River at Richmond, Tex., 1903–1906.

COLORADO RIVER (OF TEXAS) BASIN.

- Colorado River at Austin, Tex., 1895–1910.
- Colorado River at Columbus, Tex., 1902–1910.
  - San Saba River near San Saba, Tex., 1904–1906.

GUADALUPE RIVER BASIN.

- Guadalupe River near Cuero, Tex., 1903–1906.

RIO GRANDE BASIN.

- Rio Grande at Thirtymile Bridge, near Creede, Colo., 1909–10.
- Rio Grande near Creede (Wason), Colo., 1907–1910.

- Rio Grande near Del Norte, Colo., 1889–1910, except 1907.
- Rio Grande near Lobatos (Cenicero), Colo., 1899–1910.
- Rio Grande near Alamosa, Colo., 1894, 1895, 1903.
- Rio Grande near Embudo, N. Mex., 1889–1903.
- Rio Grande near Buckman, N. Mex. (Rio Grande near Ildefonso), 1895–1905 and 1909–10.
- Rio Grande near San Marcial, N. Mex., 1895–1910.
- Rio Grande near El Paso, Tex., 1889–1893, 1897–1910.
- Rio Grande near Fort Hancock, Tex., 1900–1903.
- Rio Grande above and below Presidio, Tex., 1900–1910.
- Rio Grande near Langtry, Tex., 1900–1910.
- Rio Grande near Devils River (below mouth), Tex., 1900–1910.
- Rio Grande near Eagle Pass, Tex., 1900–1910.
- Rio Grande near Nuevo Laredo, Tamaulipas, Mexico, 1900–1903.
- Rio Grande near Laredo, Tex., 1903–1910.
- Rio Grande near Roma, Tex., 1900–1910.
- Rio Grande near Brownsville, Tex., 1900–1910.
  - Clear Creek near Creede, Colo., 1910.
  - Rio Grande, South Fork, near South Fork, Colo., 1910.
  - San Luis Creek near Villa Grove, Colo., 1910.
    - Saguache River near Saguache, Colo., 1910.
  - Conejos River near Mogote, Colo., 1899, 1900, 1903–1910.
  - Culebra River at San Luis, Colo., 1910.
  - Rio Colorado above Questa, N. Mex., 1910.
  - Rio Colorado below Questa, N. Mex., 1910.
  - Rio Hondo near Arroyo Hondo, N. Mex., 1910.
  - Rio Pueblo de Taos near Taos, N. Mex., 1910.
  - Rio Pueblo de Taos at Los Cordovas, N. Mex., 1910.
    - Rio Lucero near Taos, N. Mex., 1910.
    - Rio Fernando de Taos near Taos, N. Mex., 1910.
  - Chama River near Abiquiu, N. Mex., 1895–1897.
  - Santa Fe Creek at Monument Rock, near Santa Fe, N. Mex., 1910.
  - Santa Fe Creek at Santa Fe, N. Mex., 1907–1909.
    - Santa Fe Water & Light Co.'s ditch near Santa Fe, N. Mex., 1910.
  - Rio Puerco at Rio Puerco, N. Mex., 1910.
  - Rio Puerco near La Joya, N. Mex., 1910.
    - San Jose River near Suwanee, N. Mex., 1910.
  - Mimbres River near Faywood, N. Mex., 1908–1910.
    - Cameron Creek at Fort Bayard, N. Mex., 1907–1910.
      - Stevens Creek at Fort Bayard, N. Mex., 1907–1910.
  - Rio Tularoso at Mescaleo, N. Mex., 1910.
  - Rio La Luz at La Luz, N. Mex., 1910.
  - Pecos River at Cowles, N. Mex., 1910.
  - Pecos River near Anton Chico, N. Mex., 1910.
  - Pecos River at Santa Rosa, N. Mex., 1903–1906, 1910.
  - Pecos River near Fort Sumner, N. Mex., 1904–1910.
  - Pecos River near Roswell, N. Mex., 1903–1906.
  - Pecos River near Dayton, N. Mex., 1905–1910.
  - Pecos River near Lakewood, N. Mex., 1906–1910.
  - Pecos River at Avalon, N. Mex., 1906–7.
  - Pecos River at Carlsbad, N. Mex., 1903–1908.
  - Pecos River near Pecos, Tex., 1898–1907.
    - Margueretta flume near Pecos, Tex., 1898, 1900–1908.
  - Pecos River near Moorhead, Tex., 1900–1910.

- Rio Grande—Continued.
  - Pecos River at High Bridge, near Lozier, Tex., 1898.
    - Gallinas River near Las Vegas, N. Mex., 1903–1910.
    - Taylor Moore ditch near Roswell, N. Mex., 1905.
    - Hondo River below Hondo reservoir, N. Mex., 1903–1906.
    - Hondo reservoir inlet near Hondo reservoir, N. Mex., 1906–1908.
    - Hondo reservoir scour gage No. 1 near Hondo reservoir, N. Mex., 1906.
    - Hondo River near Roswell, N. Mex., 1903–1906.
      - Rio Ruidoso near Glencoe, N. Mex., 1910.
    - Penasco River near Dayton, N. Mex., 1905–1908.
    - Lake McMillan at Lakewood, N. Mex., 1906–7.
  - Devils River near Devilsriver, Tex., 1900–1910.
  - Rio Salado at Guerrero, Tamaulipas, Mexico, 1900–1910.
  - Rio San Juan at La Quemada, Tamaulipas, Mexico, 1900–1902.
  - Rio San Juan at Santa Rosalia ranch, Tamaulipas, Mexico, 1902–1910.

IX. COLORADO RIVER BASIN.

- Green River (head of Colorado) near Kendall, Wyo., 1910.
- Green River at Green River, Wyo., 1895–1906.
- Green River at Jensen, Utah, 1903–1906.
- Green River at Ouray, 1904–5.
- Green River at Greenriver, Utah, 1894–1899 and 1905–1910.
- Green River at Little Valley, Utah, 1910.
- Colorado River at Hardyville, Ariz., 1905–1907.
- Colorado River at Mohave City, Ariz., 1902–3.
- Colorado River at Yuma, Ariz., 1895–1909.
  - Newfork Creek near (10 miles above) Cora, Wyo., 1910.
  - Newfork River near (3 miles below) Cora, Wyo., 1905.
  - Pine Creek near Pinedale, Wyo., 1904–1906 and 1910 (diversions between old and new stations).
  - Pole Creek at Fayette, Wyo., 1904–1906.
  - Pole Creek near Pinedale, Wyo., 1910.
    - Fall Creek at Fayette, Wyo., 1904–5.
  - Boulder Creek at Boulder (Newfork) Wyo., 1904–1906.
  - Eastfork River at Newfork, Wyo., 1905–6.
  - Green River, Black Fork, at Granger, Wyo., 1896–1900.
  - Beaver Creek near Ladore, Colo., 1910.
  - Vermillion Creek at Ladore, Colo., 1910.
  - Yampa River at Yampa, Colo., 1910.
  - Yampa River at Steamboat Springs, Colo., 1904–1906 and 1910.
  - Yampa River at Craig, Colo., 1901–2, 1904–1906, and 1910.
  - Yampa River at Maybell, Colo., 1904–5 and 1910.
    - Terrible Creek:
      - Trout Creek at Pinnacle, Colo., 1910.
    - Soda Creek at Steamboat Springs, Colo., 1910.
    - Elk River at Clark, Colo., 1910.
    - Elk River near Trull, Colo., 1904–1906 and 1910.
      - Sage Creek:
        - Fish Creek at Dunkley, Colo., 1910.
    - Elk Head Creek near Craig, Colo., 1906 and 1910.
    - Fortification Creek at Craig, Colo., 1905–6 and 1910.
    - Williams River near Hamilton, Colo., 1910.
    - Williams River at Hamilton, Colo., 1904–1906 and 1910.

- Colorado River—Continued.
  - Yampa River—Continued.
    - Milk Creek at Axial, Colo., 1904–5.
    - Little Snake River at Dixon, Wyo., 1910.
    - Little Snake River at Maybell, Colo., 1904.
    - Slater Creek near Slater, Colo., 1910.
  - Ashley Creek at Vernal, Utah, 1900–1904.
    - Ashley Creek, Dry Fork, at Vernal, Utah, 1904.
  - White River,[1] North Fork, at Buford, Colo., 1903–1906 and 1910.
  - White River at Meeker, Colo., 1901–1906 and 1910.
  - White River at White River City, Colo., 1895.
  - White River at Rangely, Colo., 1904–5.
  - White River at Dragon, Utah, 1906.
  - White River at Ouray, Utah, 1904.
    - Marvine Creek near Buford, Colo., 1903–1906.
    - White River, South Fork, near Buford, Colo., 1903–1906 and 1910.
  - Duchesne River, North Fork (head of Duchesne River), above Forks, Utah, 1904.
  - Duchesne River at Myton, Utah, 1899–1910.
    - Duchesne River, West Fork, above Forks, Utah, 1904.
    - Rock Creek, (East Creek) 10 miles above mouth, Utah, 1904.
    - Strawberry River above mouth of Indian Creek, in Strawberry Valley, Utah, 1909–10.
    - Strawberry River below mouth of Indian Creek, in Strawberry Valley, Utah, 1903–1906 and 1908–9.
    - Strawberry River at Theodore, Utah, 1908–1910.
      - Indian Creek in Strawberry Valley, Utah, 1905–6 and 1909–10.
        - Trail Hollow Creek in Strawberry Valley, Utah, 1909–10.
      - Currant Creek 13 miles above mouth, Utah, 1904.
      - Currant Creek 3 miles above mouth, Utah, 1904.
        - Red Creek above Narrows, Utah, 1904.
    - Lake Fork, West Fork, 10 miles above Forks, Utah, 1904.
    - Lake Fork, below Forks, Utah, 1904, 1907–1910.
    - Lake Fork near Myton, Utah, 1900–1904, 1907–1910.
      - Lake Fork, East Fork, 8 miles above Forks, Utah, 1904.
    - Uinta River near Whiterocks, Utah, 1899–1904, 1907–1910.
    - Uinta River at Fort Duchesne, Utah, 1899–1904, 1906–1910.
    - Uinta River at Ouray School, Utah, 1899–1904.
      - Whiterocks River near Whiterocks, Utah, 1899–1904, 1907–1910.
  - Price River near Helper, Utah, 1904–1910.
  - San Rafael River near Greenriver, Utah, 1909–10.
    - Cottonwood Creek near Orangeville, Utah, 1909–10.
      - Ferron Creek near Ferron, Utah, 1909–10.
    - Huntington Creek near Huntington, Utah, 1909–10.
  - Grand River, North Fork, near Grand Lake, Colo., 1904–1910.
  - Grand River near Granby, Colo., 1908–1910.
  - Grand River at Sulphur Springs, Colo., 1904–1910.
  - Grand River near Kremmling, Colo., 1904–1910.
  - Grand River near Wolcott, Colo., 1906–1908.
  - Grand River at Shoshone, Colo., 1897.
  - Grand River at Glenwood Springs, Colo., 1899–1910.
  - Grand River near Palisades, Colo., 1902–1910.
  - Grand River near Grand Junction, Colo., 1895–1900.

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[1] The station maintained in 1910 is 5 miles below the old station, but no large tributaries enter between.

- Colorado River—Continued.
  - Grand River—Continued.
    - North Inlet to Grand Lake at Grand Lake, Colo., 1905–1910.
    - Grand Lake Outlet at Grand Lake, Colo., 1904–1910.
    - Grand River, South Fork, near Lehman, Colo., 1907–8.
    - Fraser River near Arrow, Colo., 1910.
    - Fraser River at upper station near Fraser, Colo., 1908–1910.
    - Fraser River at lower station near Fraser, Colo., 1907–1909.
    - Fraser River at Granby (Coulter), Colo., 1904–1909.
      - Big Jim Creek near Fraser, Colo., 1907–1909.
        - Little Jim Creek near Fraser, Colo., 1907–1909.
      - Vasquez Creek at upper station near Fraser, Colo., 1908–9.
      - Vasquez Creek at lower station near Fraser, Colo., 1907–1909.
      - Elk Creek near Fraser, Colo., 1907–1909.
      - St. Louis Creek at upper station near Fraser, Colo., 1908–9.
      - St. Louis Creek at lower station near Fraser, Colo., 1908–9.
      - North Ranch Creek at upper station near Rollins Pass, Colo., 1908–9.
      - North Ranch Creek at lower station near Rollins Pass, Colo., 1907–1909.
        - Middle Ranch Creek at upper station near Arrow, Colo., 1908–9.
        - Middle Ranch Creek at lower station near Arrow, Colo., 1907–1909.
          - South Ranch Creek at upper station near Arrow, Colo., 1908–9.
          - South Ranch Creek at lower station near Arrow, Colo., 1907–1909.
    - Williams Fork near Scholl, Colo., 1910.
    - Williams Fork near Sulphur Springs, Colo., 1904–1910.
    - Troublesome River at Troublesome, Colo., 1904–5.
    - Muddy River at Kremmling, Colo., 1904–5.
    - Blue River near Dillon, Colo., 1910.
    - Blue River near Kremmling, Colo., 1904–1908.
      - Tenmile Creek near Kokomo, Colo., 1904.
      - Tenmile Creek near Uneva Lake, Colo., 1903.
      - Tenmile Creek near Dillon, Colo., 1910.
      - Snake River near Dillon, Colo., 1910.
    - Eagle River near Eagle, Colo., 1905–1907.
    - Eagle River at Gypsum, Colo., 1907–1909.
    - Roaring Fork near Emma., Colo., 1908–9.
    - Roaring Fork at Glenwood Springs, Colo., 1906–1910.
      - Frying Pan River at Basalt, Colo., 1908–9.
      - Crystal River near Marble, Colo., 1910.
      - Crystal River near Carbondale (Sewell), Colo., 1908–9.
    - West Divide Creek at Hostutler's ranch, near Raven, Colo., 1909–10.
    - West Divide Creek at Raven, Colo., 1909–10.
    - West Mamm Creek near Rifle, Colo., 1909–10.
    - Taylor River near Almont, Colo., 1905 and 1910.
    - Gunnison River at Gunnison, Colo., 1910.
    - Gunnison River near Iola, Colo., 1900–1903.
    - Gunnison River near Cimarron, Colo., 1903–1905.
    - Gunnison River at River Portal (east portal of Gunnison Tunnel), Colo., 1905–1910.
    - Gunnison River near Cory, Colo., 1903–1905.
    - Gunnison River at Roubideau, Colo., 1897.
    - Gunnison River at Whitewater, Colo., 1897, 1901–1906.
    - Gunnison River near Grand Junction, Colo., 1895, 1897–1899.
      - East River at Almont, Colo., 1905 and 1910.
        - Cement Creek near Crested Butte, Colo., 1910.

- Colorado River—Continued.
  - Grand River—Continued.
    - Gunnison River—Continued.
      - Tomichi Creek near Gunnison, Colo., 1910.
        - Quartz Creek near Pitkin, Colo., 1910.
      - Cimarron Creek at Cimarron, Colo., 1903–1905.
      - Gunnison River, North Fork, near Hotchkiss, Colo., 1903–1906.
      - Uncompahgre River near Colona, Colo., 1903–1906.
      - Uncompahgre River near Ouray, Colo., 1908.
      - Uncompahgre River near Fort Crawford, Colo., 1910.
      - Uncompahgre River at Fort Crawford, Colo., 1895–1899, 1908–1910.
      - Uncompahgre River at Montrose, Colo., 1900, 1903–1910.
      - Uncompahgre River near Delta, Colo., 1903–1910.
  - Dolores River near Dolores, Colo., 1895–1903 and 1910.
    - San Miguel River near Fall Creek, Colo., 1895–1899 and 1910.
    - San Miguel River near Placerville, Colo., 1910.
  - Fremont River near Thurber, Utah, 1909.
    - Muddy Creek near Emery, Utah, 1909.
  - Escalante Creek near Escalante, Utah, 1909.
  - San Juan River at Arboles, Colo., 1895–1899 and 1910.
  - San Juan River at Turley, N. Mex., 1907–8.
  - San Juan River at Blanco, N. Mex., 1908–1910.
  - San Juan River near Bloomfield, N. Mex., 1909–10.
  - San Juan River near Farmington, N. Mex., 1904–1906.
  - San Juan River near Shiprock, N. Mex., 1910.
    - Piedra River near Arboles, Colo., 1895–1899 and 1910.
    - Los Pinos River at Ignacio, Colo., 1899–1903 and 1910.
    - Animas River at Silverton, Colo, 1903.
    - Animas River at Durango, Colo., 1895–1905 and 1910.
    - Animas River at Aztec, N. Mex., 1904, 1907–1910.
    - Animas River near Farmington, N. Mex., 1904–5.
      - Florida River near Durango, Colo., 1899, 1901–1903, and 1910.
    - La Plata River at Hesperus, Colo., 1904–1906 and 1910.
    - La Plata River at La Plata, N. Mex., 1905–1910.
    - Mancos River at Mancos, Colo., 1898–1900.
    - West Mancos River near Mancos, Colo., 1910.
  - Little Colorado River, at St. Johns, Ariz., 1906–1910.
  - Little Colorado River, at Woodruff, Ariz., 1905–1908.
  - Little Colorado River, at Holbrook, Ariz., 1905–1910.
    - Silver Creek at Snowflake, Ariz., 1906–1908.
    - Silver Creek at Canyon Station, Ariz., 1906.
    - Woodruff ditch at Woodruff, Ariz., 1906.
    - Chevelon Fork near Winslow, Ariz., 1906–1908.
    - Clear Creek near Winslow, Ariz., 1906–1910.
  - Virgin River at Virgin, Utah, 1909–10.
    - Santa Clara River near Central, Utah, 1909–10.
    - Santa Clara River near St. George, Utah, 1909–10.
    - Muddy River near Moapa, Nev., 1904–1906 and 1910.
  - Bill Williams Fork, Planet, Ariz., 1910.
  - Gila River near Cliff, N. Mex., 1904–1907.
  - Gila River near Redrock, N. Mex., 1908–1910.
  - Gila River near Guthrie, Ariz., 1910.
  - Gila River at San Carlos, Ariz., 1899–1905 and 1910.
  - Gila River near Kelvin, Ariz., 1910.

- Colorado River—Continued.
  - Gila River near Buttes, Ariz., 1889–1890 and 1895–1899.
  - Gila River at Dome (Gila City), Ariz., 1903–1906.
    - San Francisco River at Alma, N. Mex., 1904–1907 and 1909–10.
    - San Francisco River at dam above Clifton, Ariz., 1910.
    - San Francisco River at Clifton, Ariz., 1910.
      - Whitewater Creek near Mogollon, N. Mex., 1910.
    - San Carlos River near San Carlos, Ariz., 1910.
    - San Pedro River at Charleston, Ariz., 1904–1906 and 1910.
    - San Pedro River near Dudleyville, Ariz., 1890.
    - Santa Cruz River near Nogales, Ariz., 1907 and 1909.
    - Santa Cruz River and ditches at Tuscon, Ariz., 1905–1909.
      - Queens Creek at Whitlow's, Ariz., 1896.
    - Salt River at Roosevelt, Ariz., 1901–1907.
    - Salt River below mouth of Cherry Creek, near Roosevelt, Ariz., 1906.
    - Salt River 50 miles above Phoenix, Ariz., 1890.
    - Salt River at Arizona dam, Ariz., 1888–1891.
    - Salt River at McDowell, Ariz., 1888–1910.
      - Tonto Creek at Roosevelt, Ariz., 1901–1904.
      - Verde River at McDowell, Ariz., 1888–1910.
      - Verde River at Camp Childs, Ariz., 1910.
    - Agua Fria River near Glendale, Ariz., 1910.
    - Hassayampa River near Wickenburg, Ariz., 1910.
- Salton Sea near Salton, Cal., 1904–1909.
  - Alamo River near Brawley, Cal., 1908–9.
  - New River near Brawley, Cal., 1908–9.

CANAL STATIONS IN COLORADO RIVER BASIN.

- Imperial canal (main) near Calexico, Cal., 1904–5.
- Boundary canal near Calexico, Cal., 1905.
- Wisteria canal near Calexico, Cal., 1905.
- Imperial canal 10 miles below Yuma, Ariz., Mexican boundary line, 1903–1905.
- Holt canal at Calexico, Cal., 1904–5.
- Hemlock canal at Calexico, Cal., 1904–5.
- Alamo channel near Calexico, Cal., 1904.
- Alamitos canal near Calexico, Cal., 1904–5.

X. GREAT BASIN.

WASATCH MOUNTAINS DRAINAGE BASINS.

GREAT SALT LAKE BASIN.

- Great Salt Lake at Saltair, Utah, 1904.
- Great Salt Lake at Garfield Beach gage, Utah, 1875–1899.
  - Bear River at Dingle, Idaho, 1903–1910.
  - Bear River near Preston, Idaho, 1889–1910.
  - Bear River near Collinston, Utah, 1889–1910.
  - Bear Lake at Fishhaven, Idaho, 1904–1906.
    - Cub Creek near Franklin, Idaho, 1900–1901.
    - Logan River near Logan, Utah, 1896–1910.
    - Logan, Hyde Park, and Smithfield canal, 1904, 1906–7, 1909–10.
      - Blacksmith Fork near Hyrum, Utah, 1900–1910.
      - Blacksmith Fork power plant race near Hyrum, Utah, 1904–1910.
    - Box Elder Creek at Brigham, Utah, 1909–10.

Great Salt Lake—Continued.

- Weber River near Oakley, Utah, 1904–1910.
- Weber River at Devils Slide (Croydon), Utah, 1905–1910.
- Weber River near Uinta, Utah, 1889–1901, 1903.
- Weber River near Plain City, Utah, 1903–1910.
    - Lost Creek near Croydon, Utah, 1905.
    - Chalk Creek at Coalville, Utah, 1904–5.
    - Ogden River at Ogden, Utah, 1895–1901.
- Jordan River near Lehi, Utah, 1904.
    - Utah Lake near Spanish Fork, Utah, 1895–6.
    - Utah Lake near Outlet, Utah, 1896–1900.
        - Santaquin Creek near Santaquin, Utah, 1910.
        - Payson Creek near Payson, Utah, 1908–1910.
        - Spanish Fork at Thistle, Utah, 1909–10.
        - Spanish Fork near Spanish Fork, Utah, 1900–1910.
        - United States Reclamation Service power canal near Spanish Fork, Utah, 1909–10.
        - Spanish Fork near Mapleton, Utah, 1900–1901.
        - Spanish Fork near Lake Shore, Utah, 1903–1907, 1909–10.
        - Diamond Fork near Thistle, Utah, 1908–1910.
        - Hobble Creek near Springville, Utah, 1904–1910.
        - Maple Creek near Springville, Utah, 1910.
        - Provo River above Telluride Power Company's dam near Provo, Utah, 1905–1910.
        - Provo River at mouth of canyon, near Provo, Utah, 1889–1906.
        - Provo River at Denver & Rio Grande Railroad bridge near Provo, Utah 1905.
        - Provo River at San Pedro, Los Angelês & Salt Lake Railroad bridge near Provo, Utah, 1903–4.
        - American Fork River near American Fork, Utah, 1900–1, 1093–1905.
    - Little Cottonwood Creek near Salt Lake City, Utah, 1898–1909.
    - Big Cottonwood Creek near Salt Lake City, Utah, 1898–1909.
    - Mill Creek near Salt Lake City, Utah, 1898–1909.
    - Parley's Creek near Salt Lake City, Utah, 1898–1909.
        - Emigration Creek near Salt Lake City, Utah, 1898–1909.
    - City Creek near Salt Lake City, Utah, 1898–1909.

SEVIER LAKE BASIN.

- Sevier River near Marysvale, Utah, 1906–1910.
- Sevier River near Gunnison, Utah, 1900–1910.
- Sevier River near Leamington, Utah, 1889–1893.
    - Salina Creek near Salina, Utah, 1900.
    - San Pitch River near Gunnison, Utah, 1900–1905.
        - Manti Creek near Manti, Utah, 1900.
- Beaver River near Beaver, Utah, 1906.
- Beaver River near Minersville, Utah, 1909–10.
    - South Creek near Beaver, Utah, 1906.
    - Minersville canal at Minersville, Utah, 1906.
    - North Fork of North Creek near Beaver, Utah, 1906.
        - South Fork of North Creek near Beaver, Utah, 1906.
    - Indian Creek near Beaver, Utah, 1906.

THOUSAND SPRING CREEK BASIN.

- Thousand Spring Creek near Tecoma, Nev., 1910.

HUMBOLDT RIVER.

Humboldt River near Elko, Nev., 1895–1902.
Humboldt River at Palisade, Nev., 1902–1906.
Humboldt River at Battle Mountain, Nev., 1896–97.
Humboldt River near Golconda, Nev., 1894–1910.
Humboldt River near Oreana, Nev., 1896–1910.
  Bishop Creek near Wells, Nev., 1910.
  Marys River near Deeth, Nev., 1902–3.
  Humboldt River, North Fork, near Peko, Nev., 1898–1900.
  Humboldt River, North Fork, near Halleck, Nev., 1902–1910.
  Humboldt River, South Fork, near Elko, Nev., 1896–1910.
  Pine Creek near Palisades, Nev., 1902–1904.
  Rock Creek near Battle Mountain, Nev., 1896.

SIERRA NEVADA BASINS.

TRUCKEE RIVER BASIN.

Lake Tahoe at Tahoe, Cal., 1900–1910.
Truckee River at Tahoe, Cal., 1895, 1900–1910.
Truckee River near Boca, Cal., 1890.
Truckee River at Nevada-California State line, 1899–1910.
Truckee River near Laughtons, Nev., 1890.
Truckee River at Reno, Nev., 1906–1910.
Truckee River near Essex, Nev., 1889.
Truckee River at Vista, Nev., 1890–91, 1899–1907.
Truckee River at Darby dam, Nev., 1907–1909.
Truckee River near Wadsworth, Nev., 1902–1905.
Lake Winnemucca Inlet near Wadsworth, Nev., 1902–1905.
  Donner Creek near Truckee, Cal., 1902–1910.
  Prosser Creek near Hobart Mills, Cal., 1903–4, 1907–1910.
  Prosser Creek near Boca, Cal., 1889–90, 1902–3.
  Independence Creek below Independence Lake, Cal., 1902–1907.
  Little Truckee River at Pine Station and Starr, Cal., 1903–1910.
  Little Truckee River near Boca, Cal., 1890.
  Steamboat Creek at Steamboat Springs, Nev., 1900–1901.

WALKER RIVER BASIN.

Walker River, East Fork (head of Walker River), near Mason, Nev., 1910.
Walker River, East Fork, near Yerington, Nev., 1902–1908.
Walker River near Mason, Nev., 1910.
Walker River near Nordyke, Nev., 1895.
Walker River near Wabuska, Nev., 1902–1908.
  Robinson Creek near Bridgeport, Cal., 1910.
    Buckeye Creek near Bridgeport, Cal., 1910.
  Walker River, West Fork, near Coleville, Cal., 1902–1908.

CARSON RIVER BASIN.

Carson River, East Fork (head of Carson River), near Markleeville, Cal., 1910.
Carson River, East Fork, at Rodenbah's ranch, near Gardnerville, Nev., 1900–1907.
Carson River, East Fork, at Horseshoe Bend, near Gardnerville, Nev., 1908–1910.
Carson River near Empire, Nev., 1900–1910.
Carson River near Hazen, Nev., 1908–9.
  Silver Creek near Markleeville, Cal., 1910.
  Markleeville Creek near Markleeville, Cal., 1910.
    Pleasant Valley Creek near Markleeville, Cal., 1910.
  Carson River, West Fork of, at Woodfords, Cal., 1900–1910.

HONEY LAKE BASIN.

- Susan River near Susanville, Cal., 1900–1905.
  - Willow Creek at Merrillville, Cal., 1904–5.
  - Willow Creek near Standish, Cal., 1900–1905.

MONO LAKE BASIN.

- Lee Vining Creek near Mono Lake, Cal., 1910.
- Rush Creek near Mono Lake, Cal., 1910.

OWENS RIVER BASIN.

- Owens River near Round Valley, Cal., 1903–1910.
- Owens River near Tinemaha, Cal., 1906–1910.
- Owens River near Lone Pine, Cal., 1909–10.
  - Rock Creek near Round Valley, Cal., 1903–1910.
  - Pine Creek near Round Valley, Cal., 1903–1910.
  - Bishop Creek near Bishop, Cal., 1903–1910.
  - Baker Creek near Big Pine, Cal., 1909–10.
  - Big Pine Creek near Big Pine, Cal., 1903–1910.
  - Tinemaha Creek near Tinemaha, Cal., 1907–1910.
    - Birch Creek near Tinemaha, Cal., 1907–1910.
  - Taboose Creek near Tibbetts, Cal., 1906–1910.
  - Goodale Creek near Tibbetts, Cal., 1906–1910.
  - Division Creek near Independence, Cal., 1906–1910.
  - Sawmill Creek near Independence, Cal., 1906–1910.
  - Thibaut Creek near Independence, Cal., 1908.
  - Oak Creek near Independence, Cal., 1905–1910.
  - Independence Creek near Independence, Cal., 1905–1910.
  - Shepard Creek near Thebe, Cal., 1906–1910.
  - Bairs Creek near Thebe, Cal., 1906–1910.
  - George Creek near Thebe, Cal., 1906–1910.
  - Lone Pine Creek near Lone Pine, Cal., 1906–1910.
  - Tuttle Creek near Lone Pine, Cal., 1906–1910.
  - Cottonwood Creek near Olancha, Cal., 1906–1910.
  - Ash Creek near Olancha, Cal., 1906–1910.
- Mahave River at Victorville, Cal., 1899–1906.

GREAT BASIN DRAINAGE IN OREGON.

MALHEUR AND HARNEY LAKES DRAINAGE BASIN

- Malheur Lake at The Narrows, Oreg., 1903–1905.
- Silvies River near Silvies, Oreg., 1903–1905, 1909–10.
- Silvies River near Burns, Oreg., 1903–1906, 1908–1910.
- Donner und Blitzen River near Diamond, Oreg., 1909–10.
  - McCoy Creek near Diamond, Oreg., 1909–10.
  - Keiger Creek near Diamond, Oreg., 1909–10.
- Silver Creek near Riley, Oreg., 1904–1906, 1908–1910.

WARNER LAKE DRAINAGE BASIN

- Honey Creek near Plush, Oreg., 1909–10.
- Deep Creek near Adel, Oreg., 1909–10.
  - Twentymile Creek near Warner Lake, Oreg., 1909–10.

ABERT LAKE DRAINAGE BASIN.

- Chewaucan River at Paisley, Oreg., 1905–1907 and 1909–10.

SUMMER LAKE DRAINAGE BASIN.

Ana River near Summer Lake, Oreg., 1905 and 1909-10.

SILVER LAKE DRAINAGE BASIN.

- Silver Creek near Silver Lake, Oreg., 1904-1907, 1909-10.
  - Bridge Creek near Silver Lake, Oreg., 1905-6.
  - Bear Creek near Silver Lake, Oreg., 1905-6, 1909-10.

GOOSE LAKE DRAINAGE BASIN.

Cottonwood Creek near Lakeview, Oreg., 1908-1910.
Drews Creek near Lakeview, Oreg., 1909-10.

XI. CALIFORNIA.

SOUTH PACIFIC OCEAN DRAINAGE BASINS.

- Tia Juana River:
  - Cottonwood Creek near Jamul, 1906-1910.
    - Pine Valley Creek near Jamul, 1906-1908.
- Sweetwater River near Descanso, 1906-1910.
- San Diego River and San Diego flume near Lakeside, 1906-1910.
- Bernardo River:
  - Santa Ysabel Creek near Escondido, 1906-1910.
- San Luis Rey River near Pala, 1904-1910.
- Santa Margarita River:
  - Temecula Creek near Temecula, 1906.
- Santa Ana River and Mentone Power Co.'s canal near Mentone, 1896-1910.
- San Gabriel River and power canal near Azusa, 1896-1910.
- Los Angeles River:
  - Arroyo Seco near Pasadena, 1910.
  - Malibu Creek near Calabasas, 1903-1906.
    - Triunfo Creek near Calabasas, 1903-1906.
  - Santa Ynez River near Santa Barbara, 1903-1910.
  - Santa Ynez River near Lompoc, 1906-1910.
    - Mono Creek near Santa Barbara, 1903-4.
  - Santa Maria River near Santa Maria, 1903-1905.
  - Salinas River near Salinas, 1900-1901.
    - Nacimiento River at Byron, February to April, 1901.
    - San Antonio River at Jylon, December to April, 1901.
    - San Lorenzo Creek near Kings City, 1901-1903.
    - Arroyo Seco near Soledad, 1901-1910.

SAN FRANCISCO BAY DRAINAGE BASINS.

SAN JOAQUIN RIVER BASIN.

- San Joaquin River near Friant (Pollasky), 1907-1910.
- San Joaquin River at Herndon, 1870-1910.
  - Tulare Lake in Kings County, 1906-1910.
  - Kern River at Isabella, 1910.
  - Kern River near Bakersfield, 1893-1910.
    - Kern River, South Fork, at Isabella, 1910.
    - Little Rock Creek near Palmdale, 1896-1899.
    - Tejon House Creek at Tejon ranch house, 1895-6.
    - San Emidio Creek at San Emideo ranch house, 1894-5.

- San Joaquin River—Continued.
    - Deer Creek near Hot Springs, 1910.
    - Tule River near Portersville, 1901–1910.
        - Tule River, South Fork, near Portersville, 1910.
    - Kaweah River below Three Rivers, 1903–1910.
        - Kaweah River, North Fork, at Kaweah, 1910.
    - Kings River near Sanger, 1895–1910.
    - Kings River at Kingsburg, 1895–1904.
        - Kings River, North Fork, near Ockenden, 1910.
            - Dinkey Creek near Ockenden, 1910.
            - Big Creek near Toll House, 1910.
                - Rush Creek near Ockenden, 1910.
        - Fresno River:
            - Redwood Creek near Fresno Flats, 1910.
    - Merced River in Yosemite Valley, 1904–1909.
    - Merced River above Merced Falls, 1901–1910.
        - Tenaya Creek in Yosemite Valley, 1904–1910.
        - Yosemite Creek in Yosemite Valley, 1904–1909.
        - Merced River, South Fork, at Wawona, 1910.
            - Big Creek near Sugar Pine, 1910.
            - Miami Creek near Sugar Pine, 1910.
    - Tuolumne River at Hetch Hetchy Valley dam site, 1901–1910.
    - Tuolumne River near Lagrange, 1895–1910.
    - Tuolumne River at Modesto, 1895–1897.
        - Cherry Creek at Eleanor trail crossing, 1901.
            - Eleanor Creek at Eleanor trail crossing, 1901.
            - Eleanor Creek below Eleanor Lake, 1910.
        - Jawbone Creek near Tuolumne, 1910.
        - Corrall Creek near Groveland, 1910.
        - Tuolumne River, South Fork, near Groveland, 1910.
            - Indian Creek near Groveland, 1910.
        - Clavey River near Tuolumne, 1910.
        - Tuolumne River, North Fork, near Tuolumne, 1910.
            - Hunter Creek near Tuolumne, 1910.
        - Turlock Canal near Lagrange, 1899–1910.
        - Modesto Canal near Lagrange, 1903–1910.
        - Lagrange Water & Power Co.'s canal near Lagrange, 1907–1910.
    - Stanislaus River at Knights Ferry, 1895–1900, 1903–1910.
        - Rose Creek near Columbia, 1910.
        - Knight Creek near Jupiter, 1910.
        - Stanislaus River, South Fork, near Columbia, 1910.
        - Stanislaus Water Co.'s canal at Knights Ferry, 1904–1910.
        - Calaveras River at Jenny Lind, 1907–1910.
        - Mokelumne River at Electra, 1901 and 1903–4.
        - Mokelumne River near Clements, 1904–1910.
        - Mokelumne River near Lodi, 1895.
            - Cosumnes River at Michigan Bar, 1907–1910.

SACRAMENTO RIVER BASIN.

- Sacramento River at Castella, 1910.
- Sacramento River at Antler, 1910.
- Sacramento River at Jellys Ferry, near Red Bluff, 1895–1902.
- Sacramento River at Iron Canyon, near Red Bluff, 1902–1910.
- Sacramento River at Collinsville, 1878–1885.

- Sacramento River at Sacramento, 1904–5 (gage heights only).
  - Pit River near Canby, 1904–5.
  - Pit River near Bieber, 1904–1908.
  - Pit River at Henderson, 1910.
  - Pit River at Silverthorne Ferry, 1910.
    - Pit River, South Fork, near Ivy, 1904–5.
    - West Valley Creek near Likely, 1904–5.
    - Ash Creek at Adin, 1904–5.
    - Hat Creek at Hat Creek, 1910.
    - Kosk Creek at Henderson, 1910.
    - Squaw Creek near Ydalpom, 1910.
    - McCloud River near Gregory, 1902–1908.
    - McCloud River near Baird, 1910.
  - Cottonwood Creek, North Fork, at Ono, 1907–1910.
  - Mill Creek near Los Molinos, 1909–1910.
  - Stony Creek near Fruto, 1901–1910.
    - Little Stony Creek near Lodoga, 1907–1910.
  - Feather River, North Fork (head of Feather River), above Prattville, 1905–1907.
  - Feather River, North Fork, below Prattville, 1905–1910.
  - Feather River, North Fork, near Big Bend, 1905–1910.
  - Feather River at Oroville, 1902–1910.
    - Hamilton Branch near Prattville, 1905–1909.
    - Butt Creek near Butte Valley, 1905–1910.
    - Indian Creek near Crescent Mills, 1905–1909.
    - Feather River, Middle Fork, at Cromberg, 1910.
      - Grizzly Creek near Beckwith, 1906.
    - Yuba River, North Fork (head of Yuba River), at Goodyear Bar, 1910.
    - Yuba River, North Fork, near North San Juan, 1900.
    - Yuba River at Parks Bar Ridge, near Smartsville, 1900.
    - Yuba River near Smartsville, 1903–1910.
      - Yuba River, North Fork of North Fork, at Downieville, 1910.
      - Rock Creek at Goodyear Bar, 1910.
      - Goodyear Creek at Goodyear Bar, 1910.
      - Yuba River, Middle Fork, at Freemans Crossing, 1910.
        - Oregon Creek at Freemans Crossing, 1910.
    - Bear River at Van Trent, above Wheatland, 1904–1910.
  - American River near Fairoaks, 1904–1910.
  - Cache Creek at Lower Lake, 1901–1910.
  - Cache Creek near Yolo, 1903–1910.
  - Putah Creek near Guenoc, 1904–1906.
  - Putah Creek at Winters, 1905–1910.

NORTH PACIFIC OCEAN DRAINAGE BASINS.

- Russian River near Geyserville, 1910.
- Eel River near Hearst, 1910.
- Eel River near Scotia, 1910.
- Mad River near Arcata, 1910.
- Sprague River at Yainax, Oreg., 1904.
- Upper Klamath Lake near Klamath Falls, Oreg., 1904–1910.
- Link River at Klamath Falls, Oreg., 1904–1910.
- Lower Klamath Lake near Brownell, 1907–1909.
- Klamath River at Keno, Oreg., 1904–1910.
- Klamath River near Requa, 1910.
  - Sycan River near Silverlake, Oreg., 1905.

Klamath River—Continued.
    Williamson River at Klamath Agency, Oreg., 1909-10.
    Lost River at Clear Lake, 1904-1910.
    Lost River at Olene, Oreg., 1907-1910.
    Lost River near Merrill, Oreg., 1904-1910.
        Tule Lake near Merrill, Oreg., 1904-1910.
        Miller Creek at Horsefly, Oreg., 1904-1910.
    Scott River:
        Scott River, East Fork, near Callahan, 1910.
    Trinity River near Trinity Center, 1910.
        Coffee Creek near Coffee, 1910.
        Trinity River, East Fork, near Trinity Center, 1910.
        Swift Creek near Trinity Center, 1910.

XII. NORTH PACIFIC COAST BASINS.

BETWEEN KLAMATH RIVER AND COLUMBIA RIVER.

Rogue River, North Fork (head of Rogue River), at Prospect, Oreg., 1907-1910.
Rogue River near Trail, Oreg., 1910.
Rogue River near Tolo, Oreg., 1905-1910.
Rogue River near Galice, Oreg., 1906.
    Mill Creek near Prospect, Oreg., 1910.
    Big Butte Creek near Big Butte Falls, Oreg., 1910.
    Little Butte Creek at Eagle Point, Oreg., 1907-1910.
        Little Butte Creek, South Fork, near Lake Creek, Oreg., 1910.
    Bear Creek at Talent, Oreg., 1907-1910.
    Applegate Creek at Murphy, Oreg., 1907-1910.
Umpqua River, North Fork of South Fork (head of South Fork and of Umpqua River), near Tiller, Oreg., 1910.
Umpqua River, South Fork, near Tiller, Oreg., 1910.
Umpqua River, South Fork, near Brockway, Oreg., 1905-1910.
Umpqua River near Elkton, Oreg., 1905-1910.
    Umpqua River, North Fork, near Hoaglin, Oreg., 1910.
    Umpqua River, North Fork, near Oak Creek and Winchester, Oreg., 1905-1910.
        Little River near Peel, Oreg., 1910.
    Mill Creek near Ash, Oreg., 1907-1910.
Siletz River at Siletz, Oreg., 1905-1910.

COLUMBIA RIVER.

Columbia River at Wenatchee, Wash., 1910.
Columbia River near Julia, Wash., 1905.
Columbia River at Handford, Wash., 1910.
Columbia River near Pasco, Wash., 1904-1910.
Columbia River at Cascade Locks and The Dalles, Oreg., 1879-1910.
    Clark Fork at Missoula, Mont., 1898-1907.
    Clark Fork near St. Regis, Mont., 1910.
    Clark Fork near Plains, Mont., 1910.
    Clark Fork at Priest River, Idaho, 1903-1905.
    Clark Fork at Newport, Wash., 1904-1910.
    Clark Fork at Metaline, Wash., 1908-9.
        Little Blackfoot River and ditch near Elliston, Mont., 1910.
        Rock Creek near Como, Mont., 1910.

- Columbia River—Continued.
    - Clark Fork—Continued.
        - Rock Creek near Quigley, Mont., 1910.
        - Big Blackfoot River at Bonner, Mont., 1898–1905.
            - Rattlesnake Creek at Missoula, Mont., 1899–1900.
        - Bitterroot River, West Fork, near Darby, Mont., 1910.
        - Bitterroot River near Grantsdale, Mont., 1902–1907.
        - Bitterroot River near Missoula, Mont., 1898–1901, 1903–4.
            - Bitterroot River, East Fork, near Darby, Mont., 1910.
            - Lolo Creek near Lolo, Mont., 1910.
        - St. Regis River near St. Regis, Mont., 1910.
        - Flathead River, North Fork (head of Flathead River), near Columbia Falls.
        - Flathead River at Demersville near Kalispell, Mont., 1910.
        - Flathead River at Damon's ranch near Kalispell, Mont., 1910.
        - Flathead River at Holt, Mont., 1910.
        - Flathead Lake (on Flathead River) at Holt, Mont., 1900.
        - Flathead Lake at Polson, Mont., 1900–1901; 1908–1910.
        - Flathead River near Polson, Mont., 1907–1910.
            - Flathead River, Middle Fork, at Belton, Mont., 1910.
            - Flathead River, South Fork, near Columbia Falls, Mont., 1910.
            - Swan River near Big Fork, Mont., 1910.
            - Stillwater River near Kalispell, Mont., 1906–7.
                - Whitefish River near Kalispell, Mont., 1906.
            - Little Bitterroot Creek near Marion, Mont., 1910.
            - Little Bitterroot Creek near Hubbart, Mont., 1909–10.
            - Little Bitterroot Creek near Dayton, Mont., 1908–1910.
            - Crow Creek near Ronan, Mont., 1906–1910.
                - Mud Creek near Ronan, Mont., 1908–1910.
            - Mission Creek near St. Ignatius, Mont., 1906–1910.
                - Dry Creek near St. Ignatius, Mont., 1908–1910.
                - Post Creek near St. Ignatius, Mont., 1906–1910.
            - Jocko River near Jocko, Mont., 1908–1910.
            - Jocko River at Ravalli, Mont., 1906–1910.
                - Big Knife Creek near Jocko, Mont., 1908–1910.
                - Agency Creek near Jocko, Mont., 1908–1910.
                    - Blodgett Creek near Jocko, Mont., 1909–10.
                - Finley Creek near Jocko, Mont., 1908–1910.
                    - East Finley Creek near Jocko, Mont., 1908–1910.
                        - Indian Ditch near Jocko, Mont., 1908–1910.
                - Valley Creek near Ravalli, Mont., 1908–1910.
        - Priest River near Priest River, Idaho, 1910.
    - Kootenai River near Libby, Mont., 1910.
    - Kootenai River near Bonners Ferry, Idaho, 1904.
    - Kootenai River near Porthill, Idaho, 1904.
        - Yakt River near Troy, Mont., 1910.
    - St. Joe River at Avery, Idaho, 1910.
    - St. Joe River near Calder, Idaho, 1910.
    - Coeur d'Alene Lake at Coeur d'Alene, Idaho, 1903–1910.
    - Spokane River at Washington Water Power Co.'s dam at Spokane, Wash., 1891-1896.
    - Spokane River at Spokane, Wash., 1896–1910.
        - Hangman Creek at and near Tekoa, Wash., 1903–1905.
        - Hangman Creek, North Fork, near Spokane, Wash., 1904–5.
        - Little Spokane River near Spokane, Wash., 1903–1905.

Columbia River—Continued.
- Okanogan River:
    - Sinlahekin Creek near Loomis, Wash., 1903–1905.
    - Johnson Creek near Riverside, Wash., 1903–1907.
    - Salmon Creek near Malott, Wash., 1903–1910 (now called "near Okanogan").
- Methow River at Pateros, Wash., 1903–1910.
- Stehekin River near Stehekin, Wash., 1910.
- Chelan Lake at Lakeside, Wash., 1897–1899; 1905 and 1910.
- Chelan River at Chelan, Wash., 1903–1910.
    - Railroad Creek near Lucerne, Wash., 1910.
- Entiat River near Entiat, Wash., 1910.
- Wenatchee River near Leavenworth, Wash., 1910.
- Wenatchee River at Sherman Spur above Cashmere, Wash., 1904–1910.
- Wenatchee River at Cashmere, Wash., 1904–1910.
- Wenatchee River at Wenatchee, Wash., 1897.
- Upper Crab Creek at Wilson Creek, Wash., 1904.
- Upper Crab Creek near Adrian, Wash., 1910.
- Middle Crab Creek near Ephrata, Wash., 1909–10.
- Moses Lake at Moses Lake, Wash. (gage heights and evaporation records), 1909–10.
- Lower Crab Creek near Warden, Wash., 1909–10.
- Keechelus Lake (on Yakima River) near Martin, Wash., 1906–1910.
- Yakima River near Martin, Wash., 1903–1910.
- Yakima River at Easton, Wash., 1904 and 1910.
- Yakima River at Clealum, Wash., 1906–1910.
- Yakima River at Umtanum, Wash., 1906–1910.
- Yakima River at Selah Gap near North Yakima, Wash., 1897–8; 1904–5.
- Yakima River at Union Gap, near Yakima, Wash., 1893–1910.
- Yakima River near Wapato, Wash., 1908–1910.
- Yakima River at Prosser, Wash., 1904–1906.
- Yakima River at Kiona, Wash., 1895–1910.
- Yakima River near Richland, Wash., 1906–1910.
    - Cabin Creek near Easton, Wash., 1909–10.
    - Kachess Lake (on Kachess River) near Easton, Wash., 1905–1910.
    - Kachess Lake evaporation records, 1907–1910.
    - Kachess River near Easton, Wash., 1903–1910.
    - Big Creek near Clealum, Wash., 1909.
    - Clealum River, North Fork, at Galena, Wash., 1907.
    - Clealum Lake near Roslyn, Wash., 1906–1910.
    - Clealum River near Roslyn, Wash., 1903–1910.
    - Teanaway River near Clealum, Wash., 1909–10.
    - Swauk Creek near Clealum, Wash., 1909–10.
    - Taneum Creek near Thorp, Wash., 1909–10.
    - Manastash Creek near Ellensburg, Wash., 1909–10.
    - Wenas Creek near Wenas, Wash., 1910.
    - Wenas Creek near Selah, Wash., 1909–10.
    - Naches River at Anderson's ranch above Nile, Wash., 1909–10.
    - Naches River near Nile, Wash., 1904–1910.
    - Naches River below Tieton River near Naches, Wash., 1905; 1909–10.
    - Naches River near North Yakima, Wash., 1893–1910.
        - Bumping Lake (on Bumping River) near Nile, Wash., 1909–10.
        - Bumping River at Bumping Lake near Nile, Wash., 1906–7; 1909–10.
            - American River near Nile, Wash., 1909–10.
        - Tieton River at McAllister Meadows near Naches, Wash., 1908–1910.
        - Tieton River at headworks of Tieton Canal near Naches, Wash., 1906–1910.
        - Tieton River near Naches, Wash., 1902–1910.

Columbia River—Continued.
  Yakima River—Continued.
    Atanum Creek, North Fork, near Tampico, Wash., 1907-1910.
    Atanum Creek at The Narrows, near Tampico, Wash., 1908-1910.
    Atanum Creek near Yakima, Wash., 1904-1910.
      Atanum Creek, South Fork, near Tampico, Wash., 1907-1910.
    Toppenish Creek near Fort Simcoe, Wash., 1909-10.
    Toppenish Creek near Wapato, Wash., 1909-10.
    Toppenish Creek near Toppenish, Wash., 1908-1910.
    Toppenish Creek at Alfalfa, Wash., 1909-10.
      Simcoe Creek near Fort Simcoe, Wash., 1909-10.
    Satas Creek near Alfalfa, Wash., 1908-1910.

CANALS IN YAKIMA VALLEY.

Kittitas Valley.

Cascade canal near Thorp, Wash., 1905; 1909.
West Kittitas canal near Thorp, Wash., 1904; 1909.
Ellensburg Water Co. canal near Ellensburg, Wash., 1909.
Town canal near Ellensburg, Wash., 1904-5.
Olson canal near Ellensburg, Wash., 1905; 1909.
Bull canal near Ellensburg, Wash., 1909.

Yakima-Moxee Valleys.

Selah-Moxee canal near Selah, Wash., 1904-5; 1909.
Taylor canal near Selah, Wash., 1905; 1909.
Moxee canal near North Yakima, Wash., 1904-5; 1909.
Hubbard canal near North Yakima, Wash., 1904-5; 1909.
Fowler canal near North Yakima, Wash., 1904-5; 1909.
Granger canal near North Yakima, Wash., 1904; 1909.

Indian Reservation.

New Reservation canal near Yakima, Wash., 1904-1909.
Old Reservation canal near Wapato, Wash., 1904-1909.
Sunnyside canal near Wapato, Wash., 1904-1909.
Sunnyside canal at Zillah, Wash., evaporation records, 1907-8.
Gilbert canal near Toppenish, Wash., 1904.
Hatch canal near Toppenish, Wash., 1904.

Lower Yakima River.

Prosser Falls Irrigation Co.'s power canal at Prosser, Wash., 1904.
Benton Water Co.'s canal near Kiona, Wash., 1905.
Kiona canal near Kiona, Wash., 1904-5 and 1908-9.
Kiona Water Supply Co.'s canal near Kiona, Wash., 1905.
Kennewick canal near Kennewick, Wash., 1904-5.
Grosscup canal near Kiona, Wash., 1905.

Diversions from Naches River.

Above Tieton River:
  Selah Valley canal near Naches, Wash., 1904-5.
Between Tieton River and Cowiche Creek:
  Wapatox canal, upper and lower, near Naches, Wash., 1904-5, 1909.
  Clark canal near Naches, Wash., 1905, 1909.

Columbia River—Continued.
  Yakima River—Continued.
    Diversions from Naches River—Continued.
      Between Tieton River and Cowiche Creek—Continued.
        Upper Scott canal near Naches, Wash., 1909.
        Lowery canal near Naches, Wash., 1905, 1909.
        Kelly canal near Naches, Wash., 1909.
        Fortune canal near Naches, Wash., 1905, 1909.
        Lower Scott canal near Naches, Wash., 1905, 1909.
        Gleed canal near Naches, Wash., 1904–5, 1909.
        Morrisey canal near Naches, Wash., 1909.
        Congdon (Yakima Valley) canal near Naches, Wash., 1904–5, 1909.
        White & Leach canal near Naches, Wash., 1905, 1909.
        McCormick canal near Naches, Wash., 1905, 1909.
        Schuler & Rodenbach canal near North Yakima, Wash., 1909.
        Naches-Cowiche canal near North Yakima, Wash., 1904–5.
      Below Cowiche Creek:
        Power canal at North Yakima, Wash., 1904–5.
        Fruitvale-Schanno canal at North Yakima, Wash., 1909.
        R. S. & C. canal at North Yakima, Wash., 1909.
        Schanno canal at North Yakima, Wash., 1904–5, 1909.
        Broadgage canal near North Yakima., Wash., 1904–5, 1909.
        Union canal at North Yakima, Wash., 1904, 1909.
        North Yakima Town canal at North Yakima, Wash., 1904, 1909.

  Jackson Lake (on Snake River, South Fork) near Moran, Wyo., 1908.
  Snake River, South Fork (head of Snake River), at Moran, Wyo., 1903–1910.
  Snake River, South Fork, at Grovant, Wyo., 1899.
  Snake River, South Fork, near Lyon, Idaho, 1903–1910.
  Snake River, South Fork, near Heise, Idaho, 1910.
  Snake River at Idaho Falls, Idaho., 1889–1893.
  Snake River near Blackfoot, Idaho, 1910.
  Snake River at Neeley, Idaho, 1906–1910.
  Snake River at Minidoka dam, Idaho, 1910.
  Snake River near Minidoka, Idaho, 1895–1899, 1901–1910.
  Snake River at Milner, Idaho, 1909–10.
  Snake River at King Hill, Idaho, 1909–10.
  Snake River at Weiser, Idaho, 1910.
  Snake River at Burbank, Wash., 1907–1910.
  Snake River at Lewiston, Idaho, 1910.
    Buffalo River near Elk, Wyo., 1906.
      Pacific Creek near Moran, Wyo., 1906.
    Snake River, North Fork, Warm River, Idaho, 1910.
    Snake River, North Fork, near Ora, Idaho, 1902–1909.
    Snake River, North Fork, at Ferry, Idaho, 1890.
    Snake River, North Fork, near Rexburg, Idaho, 1909–10.
      Fall River near Marysville, Idaho, 1902–3.
      Fall River at Fremont, Idaho, 1904–1909 (replaces the Marysville Station).
      Fall River in Canyon, Idaho, 1890–1901.
      Teton River near St. Anthony, Idaho, 1903–1909.
      Teton River at Chase's ranch, Idaho, 1890–1893.
    Willow Creek near Prospect, Idaho, 1904.
    Blackfoot River near Rossfork, Idaho, 1908–1910 (now called "near Henry")
    Blackfoot River near Shelley, Idaho, 1909–10.
    Blackfoot River near Presto, Idaho, 1903–1909.

- Columbia River—Continued.
  - Snake River—Continued.
    - Big Lost River near Chilly, Idaho, 1904–1910.
    - Big Lost River near Mackay, Idaho, 1903–1906.
      - Little Lost River near Clyde, Idaho, 1910.
      - Birch Creek near Kaufman, Idaho, 1910.
    - Port Neuf River near Pebble, Idaho, 1910.
    - Port Neuf River at Pocatello, Idaho, 1897–1899.
    - Raft River near Bridge, Idaho, 1909–10.
      - Clear Creek near Naf, Idaho, 1910.
      - Cassia Creek near Conant, Idaho, 1909–10.
    - Goose Creek near Oakley, Idaho, 1909–10.
    - Big Cottonwood Creek near Oakley, Idaho, 1909–10.
    - Rock Creek at Rock Creek, Idaho, 1909–10.
      - McMullen Creek near Rock Creek, Idaho, 1910.
    - Salmon Falls River near San Jacinto, Nev., 1909–10.
    - Salmon Falls River near Twin Falls, Idaho, 1909–10.
      - Cedar Creek near Roseworth, Idaho, 1909-10.
    - Big Wood River near Gimlet, Idaho, 1904–5.
    - Big Wood River near Hailey, Idaho, 1889.
    - Big Wood River at Toponis, Idaho, 1896–1899.
    - Big Wood River near Shoshone, Idaho, 1905–6, 1908–1910.
    - Big Wood River near Bliss, Idaho, 1899.
      - Little Camas Creek at Little Camas Store, Idaho, 1896.
      - Little Wood River near Carey, Idaho, 1904–5.
      - Little Wood River at Toponis, Idaho, 1896–1899.
    - Little Canyon Creek at Glenns Ferry, Idaho, 1909–10.
    - Alkali Creek near Glenns Ferry, Idaho, 1909–10.
    - Cold Spring Creek near Medbury, Idaho, 1909–10.
    - Bennetts Creek near Medbury, Idaho, 1909–10.
    - Bruneau River near Tindall, Idaho, 1910.
    - Bruneau River near Hot Spring, Idaho, 1909–10.
    - Bruneau River near Grandview, Idaho, 1895–1903, 1909–10.
      - Bruneau River, East Fork, near Hot Springs, Idaho, 1910.
      - Marys Creek at Tindall, Idaho, 1910.
      - Louse Creek near Wickahoney, Idaho, 1910.
    - Castle Creek near Castle Creek, Idaho, 1910.
    - Succor Creek near Homedale, Idaho, 1903–1910.
    - Owyhee River at Owyhee, Oreg., 1890–1896, 1903–1910.
    - Boise River near Highland, Idaho, 1905–1910 (replaces the Boise Station).
    - Boise River near Boise, Idaho, 1894–1904.
    - Boise River at Caldwell, Idaho, 1895–96.
      - Malheur River, Middle Fork (head of Malheur River), above South Fork at Riverside Oreg., 1906, 1908–1910.
      - Malheur River, Middle Fork, below South Fork at Riverside, Oreg., 1909–10.
      - Malheur River near Harper's ranch, near Westfall, Oreg., 1903–1905.
      - Malheur River at McLaughlin's bridge, near Vale, Oreg., 1904–1906.
      - Malheur River at Vale, Oreg., 1890–1901, 1895–6, 1903–1910.
      - Malheur River at Halliday's bridge, near Ontario, Oreg., 1904–5.
        - Malheur River, South Fork, near Riverside, Oreg., 1910.
        - Malheur River, North Fork, near Beulah, Oreg., 1909–10.
        - Bully Creek at Warm Springs above Vale, Oreg., 1905–1907.
        - Bully Creek at Vale, Oreg., 1904–5.
        - Willow Creek near Prospect, Idaho, 1903.

Columbia River—Continued.
- Snake River—Continued.
  - Boise River—Continued.
    - Malheur River—Continued.
      - Willow Creek near Malheur, Oreg., 1904–1906.
      - Willow Creek at Dell, Oreg., 1904–1906.
    - Payette River near Horseshoe Bend, Idaho, 1906–1910.
    - Payette River at Payette, Idaho, 1895–1897.
      - Payette River, North Fork, at Lardo, Idaho, 1908–1910.
        - Payette River, Lake Fork, near McCall, Idaho, 1909–10.
    - Weiser River, West Fork (head of Weiser River), near Fruitvale, Idaho, 1910.
    - Weiser River above Weiser, Idaho, 1890–1891.
    - Weiser River at Weiser, Idaho, 1895–1904, and 1910.
      - Weiser River, Middle Fork, at Middle Fork, Idaho, 1910.
      - Crane Creek near Midvale, Idaho, 1910.
    - Powder River at Salisbury, Oreg., 1903–1910.
    - Powder River near North Powder, Oreg., 1910.
      - Eagle Creek near Baker City, Oreg., 1910.
    - Salmon River near Pierson, Idaho, 1910.
    - Salmon River at White Bird, Idaho, 1910.
      - Lake Creek near Stanley, Idaho, 1910.
      - Valley Creek near Stanley, Idaho, 1910.
      - Pahsimeroi Creek near Goldburg, Idaho, 1910.
        - Goldburg Creek near Goldburg, Idaho, 1910.
        - Big Creek near Patterson, Idaho, 1910.
    - Grande Ronde River at Hilgard, Oreg., 1903–1910.
    - Grande Ronde River at Elgin, Oreg., 1903–1910.
    - Grande Ronde River at Zindel, Wash., 1904–1910.
      - Catherine Creek near Union, Oreg., 1906–7.
      - Wallowa River at Joseph, Oreg., 1903–1910.
      - Wallowa River near Wallowa, Oreg., 1903–1907.
      - Wallowa River near Elgin, Oreg., 1903–1910.
    - Clearwater River near Lewiston, Idaho, 1910.
      - Clearwater River, Middle Fork, at Pete King Ranger Station, Idaho, 1910.
      - Clearwater River, Middle Fork, at Kamiah, Idaho, 1910.
      - Clearwater River, South Fork, near Grangeville, Idaho, 1910.
      - Clearwater River, South Fork, at Kooskia, Idaho, 1910.
    - Asotin Creek at Shelman's ranch, near Asotin, Wash., 1904–1906.
    - Asotin Creek near Asotin, Wash., 1904–5.
    - Palouse River at Elberton, Wash., 1904–5.
    - Palouse River at Hooper, Wash., 1897–1910.
      - Rock Creek near St. John, Wash., 1903–1905.
      - Cow Creek near Keystone, Wash., 1904–5.
      - Cow Creek at Hooper, Wash., 1904.

CANALS IN SNAKE RIVER BASIN.

Upper Snake River basin.

North side Minidoka canal near Minidoka, Idaho, 1909.
South side Minidoka canal near Minidoka, Idaho, 1909.
North side Twin Falls canal near Milner, Idaho, 1909.
South side Twin Falls canal near Milner, Idaho, 1909.

CANALS IN SNAKE RIVER BASIN—Continued.

Lower Snake River basin.

Columbia River—Continued.
  Snake River—Continued.
    Wilson ditch near Ontario, Oreg., 1904–5.

Owyhee River basin.

Owyhee ditch near Owyhee, Oreg., 1905.

Malheur River basin.

Vines ditch above Vale, Oreg., 1904–5.
Malheur Farmers' canal above Vale, Oreg., 1904–5.
McLaughlin ditch above Vale, Oreg., 1904–5.
"J. H." ditch above Vale, Oreg., 1904–5.
Gellerman & Frohman ditch above Vale, Oreg., 1904–5.
Sand Hollow ditch above Vale, Oreg., 1904–5.
Hope Mill ditch at Vale, Oreg., 1905.
Nevada ditch below Vale, Oreg., 1904–5.

Wallowa River basin.

Silver Lake ditch near Joseph, Oreg., 1905.
Farmers and Citizens' ditch near Joseph, Oreg., 1905.
Granger ditch at Joseph, Oreg., 1905–6.
Big Bend ditch at Joseph, Oreg., 1905.
Company ditch near Wallowa, Oreg., 1905.

Walla Walla River near Milton, Oreg., 1903–1910.
Walla Walla River at Whitman, Wash., 1897–1899.
  Walla Walla River, South Fork, near Milton, Oreg., 1903–1910.
Umatilla River at Gibbon, Oreg., 1896–1910.
Umatilla River at Pendleton, Oreg., 1891–1892, 1903–1905.
Umatilla River near Yoakum, Oreg., 1903–1910.
Umatilla River near Umatilla, Oreg., 1903–1910.
  McKay Creek near Pendleton, Oreg., 1903–4.

CANALS IN UMATILLA RIVER BASIN.

Farmers' mill ditch at Pendleton, Oreg., 1906.
Slusher & Gould ditch near Nolin, Oreg., 1905.
Lisle & Crane ditch near Echo, Oreg., 1905.
Charles Lisle ditch at Echo, Oreg., 1905.
Henrietta mill ditch at Echo, Oreg., 1905.
Wilson & Co.'s ditch at Echo, Oreg., 1905.
Allen ditch at Echo, Oreg., 1905.
Hinckle ditch at Echo, Oreg., 1905.
Pioneer ditch at Echo, Oreg., 1905.
Maxwell ditch at Echo, Oreg., 1905.
Hermiston ditch near Hermiston, Oreg., 1905.
Beitle ditch near Hermiston, Oreg., 1905.
Oregon Land & Water Co.'s ditch at Umatilla, Oreg., 1905.
Brownell ditch at Umatilla, Oreg., 1905.

Willow Creek near Arlington, Oreg., 1905–6.
John Day River near Dayville, Oreg., 1908–1910.
John Day River at McDonald, Oreg., 1904–1910.

Columbia River—Continued.
- John Day River—Continued.
    - John Day River, South Fork, at Dayville, Oreg., 1908–1910.
    - Rock Creek near Arlington, Oreg., 1905.
- Deschutes River, Rosland, Oreg., 1910.
- Deschutes River at Allen's ranch, near Lava, Oreg., 1905, 1908–1910.
- Deschutes River at West's ranch, near Lava, Oreg., 1906–1909.
- Deschutes River at Benham Falls, Oreg., 1909–10.
- Deschutes River at Bend, Oreg., 1904–1910.
- Deschutes River at Laidlaw, Oreg., 1909–10.
- Deschutes River near Cline Falls, Oreg., 1910.
- Deschutes River at Moro, Oreg., 1897–1899.
- Deschutes River near Biggs, Oreg., 1906–1910. (Replaces Moro station.)
    - Deschutes River, East Fork, at Crescent, Oreg., 1904–1908, and 1910.
    - Deschutes River, West Fork, Rosland, Oreg., 1910.
    - Deschutes River, West Fork, near Lava, Oreg., 1905–1907, 1909, and 1910.
    - Tumalo Creek near Laidlaw and Bend, Oreg., 1906–1910.
    - Lewis Creek near Laidlaw, Oreg., 1908–1910.
    - Squaw Creek and McAllister ditch near Sisters, Oreg., 1907–1910.
    - Crooked River near Post, Oreg., 1908–1910.
    - Crooked River near Prineville, Oreg., 1908–1910.
        - Ochoco Creek near Howard, Oreg., 1910.
        - Ochoco Creek and Elliot ditch near Prineville, Oreg., 1908–9.
    - Metolius River at Riggs ranch near Sisters, Oreg., 1908–1910.
    - Metolius River at Hubbards ranch, near Sisters, Oreg., 1910.
    - Metolius River at Ranger station, near Sisters, Oreg., 1910.

CANALS IN DESCHUTES RIVER BASIN.

- Central Oregon and Pilot Butte canals near Bend, Oreg., 1905–1910.
- Wimer canal near Laidlaw, Oreg., 1906–1910.
- Columbia Southern canal near Laidlaw, Oreg., 1906–1910.

- Klickitat River above and below Big Muddy River near Wright, Wash., 1905, 1907–8.
- Klickitat River at Camp Klickitat, Wash., 1908–9.
- Klickitat River at Hanson's cable, near Wright, Wash., 1908–9.
- Klickitat River at Wels Ferry near Lyle, Wash, 1906–1910.
- Klickitat River at Wright, Wash., 1907, 1909–10.
    - Big Muddy River above mouth of Cougar Creek near Wright, Wash, 1905, 1908–1910.
    - Little Klickitat near Goldendale, Wash., 1910.
- Hood River at Winans, Wash., 1905–1907 and 1910.
- Hood River at Tuckers Bridge, Wash., 1897–1899.
- White Salmon River at Husum, Wash., 1909–10.
    - Trout Creek at Guler, Wash., 1909–10.
- Little White Salmon River below Lava Creek near Cooks, Wash., 1903–1906.
- Little White Salmon River near Cooks, Wash., 1909.
- Salmon Creek near Government Camp, Oreg., 1910.
- Sandy River above Salmon Creek, McIntyre's, Oreg., 1910.
- Sandy River at Salmon, Oreg., 1908–1910.
- Sandy River near Bullrun, Oreg., 1910.
- Sandy River below Bullrun, Oreg., 1910.
    - Still Creek near Government Camp, Oreg., 1910.
    - Zigzag Creek near Rowe, Oreg., 1910.
    - Bull Run River near Bullrun, Oreg., 1907–1910.

- Columbia River—Continued.
  - Willamette River, Middle Fork, at Jasper, Oreg., 1905–1910.
  - Willamette River at Albany, Oreg., 1895–1910.
  - Willamette River near Salem, Oreg., 1910.
  - Willamette River at Oregon City, Oreg., 1909–10.
    - Willamette River, North Fork of Middle Fork, near Hazeldell, Oreg., 1909–10.
    - Kelsey River near Hazeldell, Oreg., 1909.
    - Willamette River, Coast Fork, near Goshen, Oreg., 1905–1910.
      - Willamette River, East Fork of Coast Fork:
        - Row River near Disston, Oreg., 1910.
    - McKenzie River at McKenzie Bridge, Oreg., 1910.
    - McKenzie River near Springfield, Oreg., 1905–1910.
    - Santiam River, North Fork (head of main stream), at Detroit, Oreg., 1907–1910.
    - Santiam River, North Fork, at Mehama, Oreg., 1905–1907 and 1910.
    - Santiam River at Jefferson, Oreg., 1905–6, 1908–1910.
      - Santiam River, Marion Fork, at Marion Lake near Hoover, Oreg., 1907, 1909–10.
      - Puzzle Creek near Detroit, Oreg., 1907, 1909–10.
        - Puzzle Creek, North Fork, near Hoover, Oreg., 1910.
        - Puzzle Creek, South Fork, Hoover, Oreg., 1910.
      - Permelia Creek near Detroit, Oreg., 1907, 1909–10.
      - Whitewater Creek near Detroit, Oreg., 1907.
      - Breitenbush Creek near Detroit, Oreg., 1910.
      - Santiam River, South Fork, Cascadia, Oreg., 1910.
      - Santiam River, South Fork, at Waterloo, Oreg., 1905–1907 and 1910.
    - Luckiamute River near Suver, Oreg., 1905–1910.
    - Yamhill River, South Fork, at Sheridan, Oreg., 1906–1910.
    - Yamhill River at La Fayette, Oreg., 1908–1910.
    - Molalla River near Molalla, Oreg., 1905–1909.
    - Clackamas River near Cazadero, Oreg., 1909–10.
    - Clackamas River near Cazadero, Oreg., evaporation records, 1909–10.
    - Clackamas River at Estacada, Oreg., 1908–1910.
    - Clackamas River near Barton, Oreg., 1905–1908. (Replaced by Estacada station.)
  - Lewis River above Muddy River near Cougar, Wash., 1909–10.
  - Lewis River at Peterson's ranch near Cougar, Wash., 1909–10.
  - Lewis River at Ariel, Wash., 1909.
    - Muddy River at mouth near Cougar, Wash., 1909.
    - Pine Creek at mouth near Cougar, Wash., 1909.
    - Swift Creek at mouth near Cougar, Wash., 1909.
  - Cowlitz River near Randle, Wash., 1910.
  - Cowlitz River near Mayfield, Wash., 1910.
    - Cispus River near Randle, Wash., 1910
    - Toutle River at St. Helen, Wash., 1909.
    - Toutle River near Castle Rock, Wash., 1909.

BETWEEN COLUMBIA RIVER AND PUGET SOUND.

- Chehalis River near Centralia, Wash., 1910.
- Soleduck River near Quillayute, Wash., 1891–1901.
  - Kalawa River near Forks, Wash., 1897–1901.

PUGET SOUND DRAINAGE BASINS.

- Elwha River at McDonald, Wash., 1897–1901.
- Dungeness River at Dungeness, Wash., 1897–1901.

- Dosewallips River near Brinnon, Wash., 1910.
- Duckabush River near Duckabush, Wash., 1910.
- Skokomish River, North Fork, near Hoodsport, Wash., 1910.
- Nisqually River at Park Boundary, Ashford, Wash., 1910.
- Nisqually River near La Grande, Wash., 1910.
- Puyallup River:
  - Carbon River near Fairfax, Wash., 1910.
- White River near Buckley, Wash., 1899–1902 and 1910.
  - Cedar River at Vaughn Bridge near Cedar Lake, Wash., 1898.
  - Cedar River at Cedar Lake near Northbend, Wash., 1902, 1903.
  - Cedar River near Ravendale, Wash., 1902–1910.
  - Cedar River near Seattle, Wash., 1895–1898.
- Snoqualmie River at Snoqualmie Falls, Wash., 1902–1906.
  - Skykomish River, North Fork, near Index, Wash., 1910.
  - Skykomish River near Sultan, Wash., 1910.
    - Skykomish River, South Fork, near Berlin, Wash., 1910.
    - Skykomish River, South Fork, at Index, Wash., 1902–1905.
- Stillaguamish River near Robe, Wash., 1902.
- Skagit River near Marblemount, Wash., 1909–10.
- Skagit River near Sedro Woolley, Wash., 1909.
  - Cascade River near Marblemount, Wash., 1909–10.
  - Sauk River above Whitechuck River, near Darrington, Wash., 1910.
  - Sauk River above Clear Creek, near Darrington, Wash., 1910.
  - Sauk River at Millers ranch crossing near Sauk, Wash., 1910.
    - Whitechuck River near Darrington, Wash., 1910.
    - Clear Creek near Darrington, Wash., 1910.
  - Baker Lake, Wash., 1910.
  - Baker River at Forest Boundary near Concrete, Wash., 1910.
  - Baker River near Concrete, Wash., 1910.
  - Nooksack River, North Fork (head of Nooksack Rfver), near Glacier, Wash., 1910.
  - Nooksack River near Deming, Wash., 1910.
    - Nooksack River, Middle Fork, near Deming, Wash., 1910.
    - Skookum Creek near Deming, Wash., 1910.
  - Whatcom Creek at Lake Outlet, Wash., 1910.

PUBLICATIONS RELATING TO WATER RESOURCES.

Application for any of the publications named in the following list may be made to the Director, United States Geological Survey, Washington, D. C., who will furnish copies free of charge until the Survey's stock is exhausted, after which they may be obtained by purchase at the prices given from the Superintendent of Documents, Government Printing Office, Washington, D. C. Those now out of stock at the Survey are marked by an asterisk (*); a double asterisk (**) indicates that the Superintendent of Documents' stock also is exhausted. Probably most of these reports can be consulted in the public libraries of large cities.

Attention is specially called to the "Finding list" on pages 75–77.

Cards announcing new publications of the Survey will be sent on request.

WATER-SUPPLY PAPERS.

**1. Pumping water for irrigation, by H. M. Wilson. 1896. 57 pp., 9 pls.
**2. Irrigation near Phœnix, Ariz., by A. P. Davis. 1897. 98 pp., 31 pls.
**3. Sewage irrigation, by G. W. Rafter. 1897. 100 pp., 4 pls. (See No. 22.)
**4. A reconnaissance in southeastern Washington, by I. C. Russell. 1897. 96 pp., 7 pls.
**5. Irrigation practice on the Great Plains, by E. B. Cowgill. 1897. 39 pp., 12 pls.
**6. Underground waters of southwestern Kansas, by Erasmus Haworth. 1897. 65 pp., 12 pls.
*7. Seepage water of northern Utah, by Samuel Fortier. 1897. 50 pp., 3 pls. 10c.
**8. Windmills for irrigation, by E. C. Murphy. 1897. 49 pp., 8 pls.
**9. Irrigation near Greeley, Colo., by David Boyd. 1897. 90 pp., 21 pls.
**10. Irrigation in Mesilla Valley, New Mexico, by F. C. Barker. 1898. 51 pp., 11 pls.
**11. River heights for 1896, by A. P. Davis. 1897. 100 pp.
**12. Underground waters of a portion of southeastern Nebraska, by N. H. Darton. 1898. 56 pp., 21 pls.
**13. Irrigation systems in Texas, by W. F. Hutson. 1898. 68 pp., 10 pls.
**14. New tests of certain pumps and water lifts used in irrigation, by O. P. Hood. 1898. 91 pp., 1 pl.
**15. Operations at river stations, 1897, Part I. 1898. 100 pp.
**16. Operations at river stations, 1897, Part II. 1898. 100 pp.
**17. Irrigation near Bakersfield, Cal., by C. E. Grunsky. 1898. 96 pp., 16 pls.
**18. Irrigation near Fresno, Cal., by C. E. Grunsky. 1898. 94 pp., 14 pls.
**19. Irrigation near Merced, Cal., by C. E. Grunsky. 1899. 59 pp., 11 pls.
**20. Experiments with windmills, by T. O. Perry. 1899. 97 pp., 12 pls.
*21. Wells of northern Indiana, by Frank Leverett. 1899. 82 pp., 2 pls. 10c.
**22. Sewage irrigation, Part II, by G. W. Rafter. 1899. 100 pp., 7 pls.
*23. Water-right problems of the Bighorn Mountains, by Elwood Mead. 1899. 62 pp., 7 pls. 10c.

**24. Water resources of the State of New York, Part I, by G. W. Rafter. 1899. 99 pp., 13 pls.

**25. Water resources of the State of New York, Part II, by G. W. Rafter. 1899. 101-200 pp., 12 pls.

**26. Wells of southern Indiana (continuation of No. 21), by Frank Leverett. 1899. 64 pp.

*27. Operations at river stations, 1898, Part I. 1899. 100 pp. 10c.

*28. Operations at river stations, 1898, Part II. 1899. 101-200 pp. 10c.

**29. Wells and windmills in Nebraska, by E. H. Barbour. 1899. 85 pp., 27 pls.

**30. Water resources of the Lower Peninsula of Michigan, by A. C. Lane. 1899. 97 pp., 7 pls.

**31. Lower Michigan mineral waters, by A. C. Lane. 1899. 97 pp., 4 pls.

**32. Water resources of Puerto Rico, by H. M. Wilson. 1899. 48 pp., 17 pls.

**33. Storage of water on Gila River, Arizona, by J. B. Lippincott. 1900. 98 pp., 33 pls.

*34. Geology and water resources of a portion of southeastern South Dakota, by J. E. Todd. 1900. 34 pp., 10 pls. 10c.

*35. Operations at river stations, 1899, Part I. 1900. 100 pp. 10c.

**36. Operations at river stations, 1899, Part II. 1900. 101-198 pp.

*37. Operations at river stations, 1899, Part III. 1900. 199-298 pp. 10c.

*38. Operations at river stations, 1899, Part IV. 1900. 299-396 pp. 10c.

*39. Operations at river stations, 1899, Part V. 1900. 397-471 pp. 10c.

**40. The Austin dam, by T. U. Taylor. 1900. 51 pp., 16 pls.

**41. The windmill: its efficiency and economic use, Part I, by E. C. Murphy. 1901. 72 pp., 14 pls.

**42. The windmill: its efficiency and economic use, Part II, by E. C. Murphy. 1901. 73-147 pp., 15-16 pls.

**43. Conveyance of water in irrigation canals, flumes, and pipes, by Samuel Fortier. 1901. 86 pp., 15 pls.

**44. Profiles of rivers in the United States, by Henry Gannett. 1901. 100 pp., 11 pls.

*45. Water storage on Cache Creek, California, by A. E. Chandler. 1901. 48 pp., 10 pls. 15c.

*46. Physical characteristics of Kern River, California, by F. H. Olmsted, and reconnaissance of Yuba River, California, by Marsden Manson. 1901. 57 pp., 8 pls. 10c.

*47. Operations at river stations, 1900, Part I. 1901. 100 pp. 10c.

48. Operations at river stations, 1900, Part II. 1901. 101-196 pp. 10c.

*49. Operations at river stations, 1900, Part III. 1901. 197-292 pp. 10c.

*50. Operations at river stations, 1900, Part IV. 1901. 293-388 pp. 10c.

*51. Operations at river stations, 1900, Part V. 1901. 389-488 pp. 10c.

*52. Operations at river stations, 1900, Part VI. 1901. 489-575 pp. 10c.

*53. Geology and water resources of Nez Perce County, Idaho, Part I, by I. C. Russell. 1901. 86 pp., 10 pls. 10c.

*54. Geology and water resources of Nez Perce County, Idaho, Part II, by I. C. Russell. 1901. 87-141 pp. 5c.

*55. Geology and water resources of a portion of Yakima County, Wash., by G. O. Smith. 1901. 68 pp., 7 pls. 10c.

*56. Methods of stream measurement. 1901. 51 pp., 12 pls. 15c.

*57. Preliminary list of deep borings in the United States, Part I (Alabama-Montana), by N. H. Darton. 1902. 60 pp. (See No. 149.) 5c.

**58. Storage of water on Kings River, California, by J. B. Lippincott. 1902. 100 pp., 32 pls.

*59. Development and application of water near San Bernardino, Colton, and Riverside, Cal., Part I, by J. B. Lippincott. 1902. 95 pp., 11 pls. 15c.

**60. Development and application of water near San Bernardino, Colton, and Riverside, Cal., Part II, by J. B. Lippincott. 1902. 96–140 pp.

*61. Preliminary list of deep borings in the United States, Part II (Nebraska-Wyoming), by N. H. Darton. 1902. 67 pp. 5c.

**62. Hydrography of the southern Appalachian Mountain region, Part I, by H. A. Pressey. 1902. 95 pp., 25 pls.

*63. Hydrography of the southern Appalachian Mountain region, Part II, by H. A. Pressey. 1902. 96–190 pp., pls. 26–44. 15c.

*64. Accuracy of stream measurements, by E. C. Murphy. 1902. 99 pp., 4 pls. (See No. 95.)

*65. Operations at river stations, 1901, Part I. (East of Mississippi River.) 1902. 334 pp. 20c.

66. Operations at river stations, 1901, Part II. (West of Mississippi River.) 1902. 188 pp. 10c.

**67. The motions of underground waters, by C. S. Slichter. 1902. 106 pp., 8 pls.

68. Water storage in the Truckee basin, California-Nevada, by L. H. Taylor. 1902. 90 pp., 8 pls. 10c.

69. Water powers of the State of Maine, by H. A. Pressey. 1902. 124 pp., 14 pls. 20c.

70. Geology and water resources of the Patrick and Goshen Hole quadrangles, in eastern Wyoming and western Nebraska, by G. I. Adams. 1902. 50 pp., 11 pls. 15c.

*71. Irrigation systems of Texas, by T. U. Taylor. 1902. 137 pp., 9 pls. 10c.

*72. Sewage pollution in the metropolitan area near New York City and its effect on inland water resources, by M. O. Leighton. 1902. 75 pp., 8 pls. 10c.

73. Water storage on Salt River, Arizona, by A. P. Davis. 1902. 54 pp., 25 pls. 20c.

*74. Water resources of the State of Colorado, by A. L. Fellows. 1902. 151 pp., 14 pls. 25c.

**75. Stream measurements, 1901, by F. H. Newell. 1903. 246 pp., 13 pls. 25c.

76. Observations on the flow of rivers in the vicinity of New York City, by H. A. Pressey. 1903. 108 pp., 13 pls. 15c.

77. The water resources of Molokai, Hawaiian Islands, by Waldemar Lindgren. 1903. 62 pp., 4 pls. 10c.

78. Preliminary report on artesian basins in southwestern Idaho and southeastern Oregon, by I. C. Russell. 1903. 53 pp., 2 pls. 5c.

79. Normal and polluted waters in northeastern United States, by M. O. Leighton. 1903. 192 pp. 10c.

*80. The relation of rainfall to run-off, by G. W. Rafter. 1903. 104 pp. 10c.

*81. California hydrography, by J. B. Lippincott. 1903. 448 pp., 1 pl. 25c.

82–85. Stream measurements for the calendar year 1902:

- *82. Part I. Northern Atlantic coast and St. Lawrence River drainage, by F. H. Newell. 1903. 199 pp. 10c.
- 83. II. Southern Atlantic, eastern Gulf, and Great Lakes drainage, by F. H. Newell. 1903. 304 pp. 20c.
- *84. III. Western Mississippi River and western Gulf drainage, by F. H. Newell. 1903. 200 pp. 10c.
- *85. IV. Interior basin, Pacific Coast, and Hudson Bay drainage, by F. H. Newell. 1903. 250 pp. 15c.

86. Storage reservoirs of Stony Creek, California, by Burt Cole. 1903. 62 pp., 16 pls. 25c.

**87. Irrigation in India (second edition), by H. M. Wilson. 1903. 238 pp., 27 pls.

88. The Passaic flood of 1902, by G. B. Hollister and M. O. Leighton. 1903. 56 pp., 15 pls. 15c.

89. Water resources of the Salinas Valley, California, by Homer Hamlin. 1904. 91 pp., 12 pls. 15c.

90. Geology and water resources of part of the lower James River valley, South Dakota, by J. E. Todd and C. M. Hall. 1904. 47 pp., 23 pls. 35c.

91. The natural features and economic development of the Sandusky, Maumee, Muskingum, and Miami drainage areas in Ohio, by B. H. and M. S. Flynn. 1904. 130 pp. 10c.

92. The Passaic flood of 1903, by M. O. Leighton. 1904. 48 pp., 7 pls. 5c.

*93. Proceedings of first conference of engineers of the Reclamation Service, with accompanying papers, compiled by F. H. Newell, chief engineer. 1904. 361 pp. (Apply to Reclamation Service.) 25c.

*94. Hydrographic manual of the United States Geological Survey, prepared by E. C. Murphy, J. C. Hoyt, and G. B. Hollister. 1904. 76 pp., 3 pls. 10c.

*95. Accuracy of stream measurements (second, enlarged edition), by E. C. Murphy. 1904. 169 pp., 6 pls. 15c.

96. Destructive floods in the United States in 1903, by E. C. Murphy. 1904. 81 pp., 13 pls. 15c.

97–100. Stream measurements for the calendar year 1903:

- 97. Part I. Northern Atlantic, St. Lawrence River, and Great Lakes drainage, by J. C. Hoyt. 1904. 518 pp., 1 pl. 30c.
- 98. II. Southern Atlantic, eastern Gulf of Mexico, and eastern Mississippi River drainage, by J. C. Hoyt. 1904. 313 pp., 1 pl. 20c.
- 99. III. Western Mississippi River and western Gulf of Mexico drainage, by J. C. Hoyt. 1904. 422 pp., 1 pl. 25c.
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